MAY, 1950

American Engineer

Education Issue

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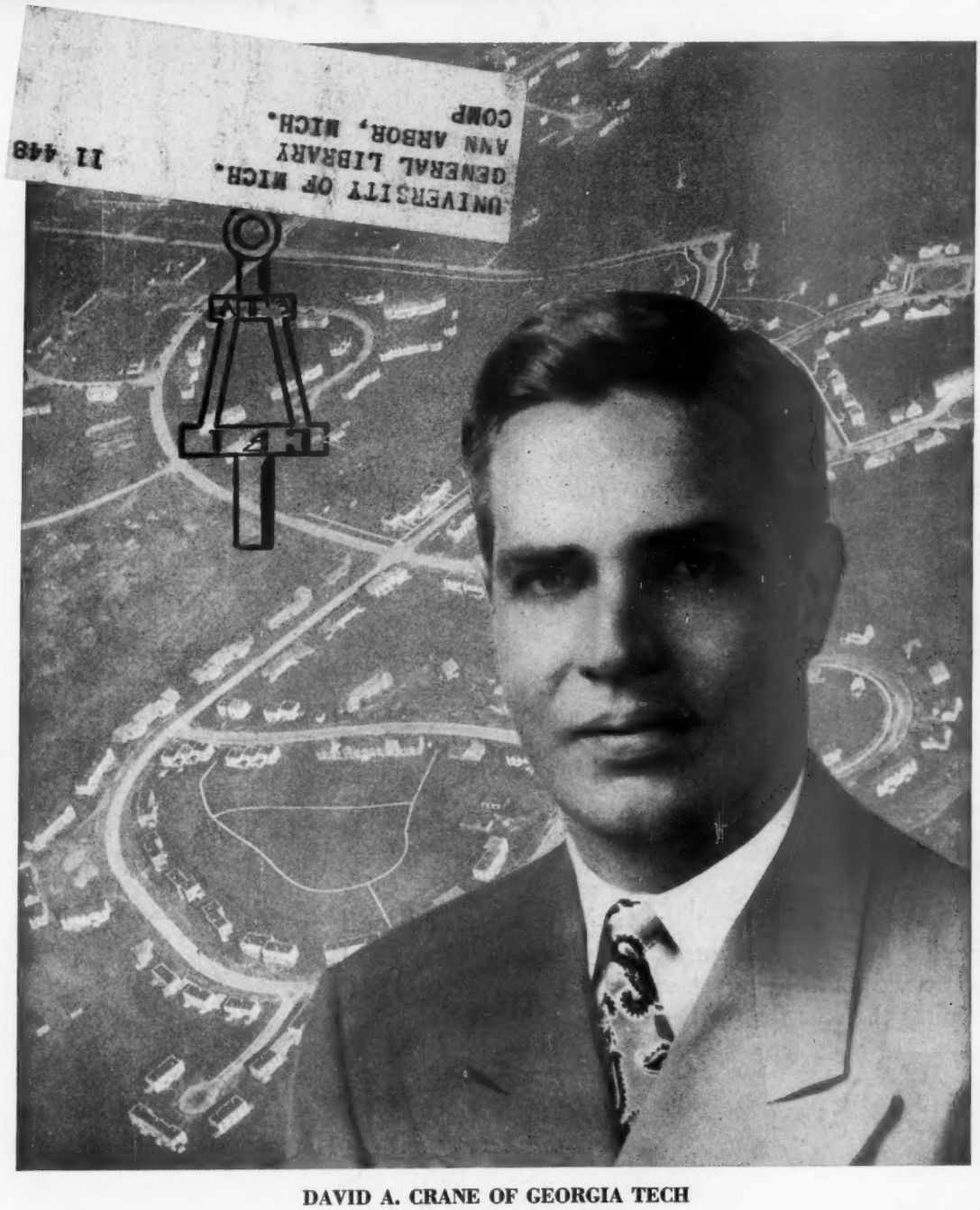
EDUCATING THE 1950 MODEL ENGINEER
By DEAN S. C. HOLLISTER



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"If business and industry could not draw upon a large reservoir of educated manpower, they would be handicapped in every phase of their operations. If our hope of an advancing American economy involves reducing costs, increasing individual productivity, and devising better ways of doing things, we must consider that we have a major interest in helping American educators in their work."

FRANK W. ABRAMS,
Chairman of the Board,
Standard Oil of New Jersey

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• AN EDITORIAL •

Today's Graduates Must Become Tomorrow's Professionals

That a sheepskin does not make a professional man is a truism that scarcely needs repeating. The keel has been laid, yes, but the super-structure is yet to be added. The final mold of the super-structure is dependent upon two things: the character of the man himself, and the character of those in whose footsteps he will follow.

Molding of the man himself in his young years is usually left to such educators as Cornell's Dean Hollister who writes an article beginning on page five of this special Education Issue. These educators have done an excellent job of preparing our engineers for their professional life ahead, but much of their guidance must necessarily end at the campus gates. With college behind, the young graduate needs and expects help from those who have gone on.

On page ten a recent graduate and EIT tells of the feeling of bewilderment that comes with passage into the "outside." The fact that he must plead for older engineers to answer his questions and give him advice, does not speak well for those experienced men who call themselves professionals.

If the educators have done their jobs better than those in the business world, what can be done about it? Some of the answers lie in the EIT program. As Professor Solberg of Purdue points out on page twelve, we need an expansion of this work and now. And much of the labor yet to be done falls squarely upon those who profess a true professional consciousness.

The real professional engineer feels he is leaving the neophyte following him at great heritage. Let us guide and advise him so he will handle it wisely and well.

ON THE COVER . . .

The young man on the cover of this special Education Issue has long had a favorite dream. He'd like to help make America's (and the World's) cities truly planned cities of wide streets and spacious playgrounds. Last month David Crane's dream was well on its way toward reality. After four years of working his way through Georgia Tech, he was granted a Tau Beta Pi fellowship to study city planning at Harvard. Son of a missionary, Dave placed 32nd in a class of 1150.

Educating The 1950 Model Engineer

By
Dean S. C. Hollister
Dean of Engineering and Vice President, Cornell University

I HAVE been asked to discuss with you the training of the "1950 model" engineer. I assume what is meant is not the training of the man who is now, in 1950, reaching his prime of professional practice; that man was trained 25 years ago. I assume what is meant is the training of the 1950 freshman who this year is entering upon his professional life.

But first, let us take a brief look at our engineering profession as it stands today. It has been clear for some time, I believe, that the engineer is not keeping up with the developments of science to the extent that he should. This situation is due to the fact that we are still clinging to our tradition of training heavily in the *art* of engineering. Some curricula have been planned to aim at the training of both technicians and engineers. I do not believe we can successfully achieve our goal in engineering education so long as we consider the curriculum to have a dual purpose in serving two objectives so widely separated as these two.

There is another bifurcation which I think we should avoid. Some people believe we can train adequately for not just one branch of engineering but for all branches of engineering combined, and at the same time provide a training of a much more general nature for those who wish only a smattering of engineering and who expect to spend their life in allied fields. I believe the engineering profession is being asked to assume a responsibility far too great to permit us in engineering education in the limited time at our disposal to deviate too far from the major task at hand. We should, I believe, be thoroughly free to indulge in various educational experiments; but I believe these experiments should be toward a common end and should not digress from the major issue.

Few Non-Technicals

Now, then, what of this educating the 1950 model engineer? If we are to consider the educational significance of statistical evidence available, we must admit that it argues in favor of a curriculum strong in general subjects and in technical content. The small number of people engaged in non-technical administration and sales argues against watering down the technical content in favor of more business courses. On the other hand, the need for training in managerial techniques is clearly indicated. It must be introduced, however, not at the expense of the technical content or of the general educational content. It clearly argues for a professional approach to engineering training as against the semi-professional, semi-vocational approach which has characterized so much of our engineering ducation in past years.

THE Harvard report on general education in a free society suggests four major objectives to be obtained through higher education. They are the ability to:

1. Think effectively
2. Communicate thought

3. Make relative judgments
4. Discriminate among values

These objectives appropriately apply to general education. They are desirable also in specialized education. In the latter field, however, some additional objectives seem appropriate; and some of those for general education need bringing into somewhat sharper focus. I suggest, in addition to the foregoing, that the following be added to the *total* list of objectives:

1. Acquisition of a body of specific knowledge
2. Ability to isolate facts from opinion
3. Ability to reason with mathematical rigor; i.e., analyze accurately
4. Acquisition of a habit of thoroughness
5. Development of the powers of synthesis
6. Enhancement of the ability of ingenuity and resourcefulness
7. Development of the ability for prognosis
8. Development of an interest in further self-development

IT is clear that some of these objectives may be built into the curriculum through the subject matter involved, or the disciplinary character of the material taught. Many of the objectives, however, will be achieved only through the manner in which the teaching is conducted. They are not accounted for through subject matter or any methodology of teaching that may be adopted. They are to be found in the character and abilities of the teachers themselves.

About Culture

So far none of the objectives presented has mentioned the acquisition of culture. I would consider a man to be cultured who has attained the quality of perception of beauty in all its forms: beauty not alone in the sense of quality of emotional stimulus of the senses, but beauty also of ideas, of principles, of attitudes. There is sheer beauty in a mathematical demonstration, or in the proof of a principle in thermodynamics. There is beauty in the drama of discovery. These are things which can be brought to the student only through the richness of the personality of the student which will last throughout his life, and mark him as a truly educated man.

EARLY in this discussion it was noted that the training being given to students in engineering today is presumably aimed toward their professional engineering work twenty-five years hence; likewise that engineers working in their prime today were trained twenty-five or more years ago. It would be nice if we could determine with some assurance what would happen 25 years hence so that we might train precisely for such events. It would certainly have been better 25 years ago had we been able to foresee what has now since transpired.

What is likely to happen over the next 25 years? One might assume the attitude that he is not a prophet or crystal-gazer, and will not indulge in such clairvoyant gymnastics. The fact is, however, that the engineering educator, if he be true to his trust, must make the best possible estimate that he can of what the future holds, since it is for the future that he is training the students in his care.

As we turn our faces forward, therefore, remembering that man has been on this planet upwards of a million years and that his technical and scientific progress has taken place largely during the last twelve periods of twenty-five years' duration, it does not seem to me that we are over-optimistic in believing that the greatest of all developments will come to fruition during the period we are now beginning.

Five Divisions

WHAT does all this mean in terms of engineering education? What is the pattern of curriculum, of course content, of educational methods, of depth of training, that we must give to the engineers who are going to accomplish this huge task?

Any engineering curriculum may be divided up into five rather abritrary divisions as follows:

1. Basic science—consisting of the broad treatment of chemistry, physics, mathematics, biology.
2. Applied science—including such subjects as thermodynamics, fluid mechanics, mechanics of materials, properties of matter, electronics, etc.
3. Applied engineering—including such subjects as radio engineering, heat power application, structural design, hydraulic design, etc.
4. Managerial techniques—such as cost accounting, quality controls, methods engineering, etc.
5. General education—including languages, literature, history, psychology, economics, etc.

TREATING the first four of these groups as necessary to the specialized educational field of engineering, and the last as representing, in part at least, general education, we must make up our minds at the outset whether there shall be a blending of the two fields of education. The majority of those responsible for engineering education are convinced that the professional needs of the engineer of the present, and certainly of the future, lie in both of these areas. Many schools already have adopted the policy of inclusion of general educational subjects in their undergraduate engineering programs. Many educators in engineering feel that it is unfortunate that we have so little time for such training, and that even though some schools devote as much as one whole year to such content outside of the sciences, it is not all that we would desire. In laying out the content of the general educational stem we would certainly wish to enhance the ability to communicate; hence literature, language and public speaking would be included. We would wish our engineers to know something about economics and something about psychology. We would also wish them to understand the history of the development of civilization in modern times, not alone in the political area, but in the economic and scientific area as well. It is in these latter areas that the ways of modern civilization have changed form so rapidly through developments in engineering. We would wish also to include in the general educational stem an opportunity for the individual to pursue some studies of his own choosing, so that he may enrich himself in accordance with his own tastes and abilities and not be forced into a completely standardized mold.

CONSIDERING now the technical stem of the curriculum we must decide on the allotment of basic and applied science on the one hand, and engineering application on the other. It is in this latter portion of the training that we din connection with the reality of the practical engineering world. It is also in this area that we give instruction which is of immediate use to the young graduate when he goes out into the field or into industry. It is these same subjects, however, that will obsolesce first in the whole list of studies.

We must, I believe, reappraise the position that we have taken in former years, namely, that this group of subjects in applied engineering is the group of subjects which should dominate the engineering curriculum. It seems to me that it would be better policy to view frankly the function of these courses in the curriculum. The purpose then should be: (1) to explain the application of basic science to engineering situations; (2) to emphasize the manner in

which engineering procedures are conducted in the application of science to engineering problems of design, construction and operation; (3) to give the young student a picture of the state of the art of engineering and the extent to which the scientific content is at present utilized in the development of engineering work; (4) to utilize the applied engineering courses as a medium of further development of their basic scientific knowledge.

Full Range of Training

Too frequently in the teaching of these engineering subjects we see failure to apply the full range of scientific training, acquired in the early years of the curriculum. In many instances the student gains the impression that much of the early scientific training he has received is a waste of his time and that he will not need it in the practice of engineering. These impressions of the upperclassmen, gained from such defective instruction, filter back down to the freshmen and sophomore classes to the great detriment of the effectiveness of training in the basic sciences.

This is particularly unfortunate because the science content of the curriculum is the portion of the curriculum which will give the greatest sustaining power to the young engineer as he moves forward in his life's work. It is the skeleton on which he will build his further accumulation of knowledge through study and experience. It will serve as a means of coordinating that knowledge and of making it most effective in times of need. When we review what is to be accomplished in the next twenty-five year period we should hesitate to suggest to the young engineering student, whether we be teachers of upper class courses or practicing engineers in the field, that they are not going to have much use for mathematics, physics, or chemistry when they get into the engineering field. Whereas in many instances this has been true in the past, it is going to be far less true in the future. It is for the future that we are training these young men, not the past. What was good in our day is not going to be good in theirs. We can see clearly that they are going to need much more reinforcement in scientific education than we did in our time.

If we do not intend to use the basic science training in the courses that will follow, we might just as well take out such training, because it is not going to be effectively driven home through example in applications to engineering situations. If we drop these courses we then convert the whole curriculum into a technical institute type of course. To the extent that we do not use the scientific training provided in our curriculum in the later courses we are tending to make this conversion anyway. We are not, by so doing, holding the work up to engineering standards. I fear we are lax in making full use of the science courses in the later engineering courses. If there is doubt whether this is an accurate statement we only need to recall the large amount of training done by ESMWT in the early days of war preparation, much of which was given to fairly recent engineering graduates who needed refresher courses in order to supply knowledge they should have had from their collegiate studies.

We now come to the question of the length of the curriculum. I wish to make it clear that what I have been talking about throughout is the undergraduate curriculum, and that the person being trained is the rank-and-file of the engineering profession, and not the specialist who has been subjected to graduate instruction. It will, of course, be necessary to carry on graduate work for those who are suited to it; and it is recognized that a lot of future development that will take place in our research laboratories will be in the hands of people who have taken work beyond the ordinary undergraduate program. Nevertheless, we are going to have to depend pretty largely for our construction and operation, as well as for much of the design of the engineering works of the future, upon the product of our undergraduate curricula. The quandary facing the engineering schools is how to do this job, while at the same time clinging to the traditional four-year program.

The educator must make the best possible estimate of what the future holds, since it is for the future that he is training the students in his care, the author points out.

Broad Re-evaluation

The situation, it seems to me, calls for a broad re-evaluation of the role of engineering education. Our professional responsibilities have grown greatly. To service them we must expand our training beyound former bounds. The outline of the curriculum must meet the needs. It is improper that we would try to force the profession to accept the limitations imposed by the curriculum. We must give education of a more general nature to our engineers. At the same time, we must step up the technical content beyond what it has been. We cannot do the job properly by lowering the quality or quantity of undergraduate content and transferring more work to the graduate area.

(*Continued on page* 29)

Industrial organizations report they plan to hire 28% fewer engineers in 1950 than they did in 1949.

1950 Employment Programs for Graduates In Engineering and Physical Science

Report of
General Survey Committee, Engineers Joint Council*

In view of the response to its 1949 survey of employment programs for engineering graduates and the interest in that survey's results, the General Survey Committee of the Engineers Joint Council now has completed a similar survey of the 1950 programs.

The points covered by the new survey are as follows:

1. The relative demand in 1949 and 1950 for inexperienced graduates in engineering and physical science from industry, government, and the engineering colleges. Last year's survey did not cover graduates in physical science or the demands from engineering colleges. More detailed information concerning the numbers of men sought with bachelor's, master's, and doctor's degrees also was requested this year.

2. The 1950 starting salaries for such graduates with bachelor's, master's, and doctor's degrees, together with related information on differentials by curricula, credits for military service, and increases during the first year of employment.

Information secured last year concerning the trend of salaries for engineering graduates ten years out of college was not requested in 1950.

In order to appraise the nature of the sample covered, both surveys requested information concerning the character of the responding organization, its total number of employees, and the number of graduates in engineering and in physical science in its employ.

By concentrating in part on organizations responding last year, this year's survey was limited to 311 industrial companies and 45 governmental agencies. The 114 engineering colleges included were those for which, with a few minor exceptions, the dean or president was listed in the 1949 year book for the American Society for Engineering Education. Information requested from these institutions concerned only teaching and research positions requiring more than half time service. Usable information in regard to engineering graduates was received in time for tabulation from 144 companies, 70 per cent of which responded last year, 23 government agencies, all but one of which did so, and 64 engineering schools. Eighty-five of the companies, 11 of the government agencies and 28 of the engineering schools also provided data concerning graduates in physical science. In particular, such data were not furnished by schools associated with universities for which the teaching in these fields was carried on by the arts and sciences college.

Although the total number of companies and governmental agencies covered is 167, as compared with 198 last year, it is believed that an excellent sample of organizations with definite employment programs for technical graduates has been secured. As suggested in the discussion following, it is probably not a good sample of the entire corresponding field of opportunity for such graduates. The sample for the engineering colleges seems entirely adequate.

Summary of Findings

The industrial companies providing data on their engineering graduates have a total of 3,090,000 employees, of whom 66,400 are graduate engineers. Since the government agencies included, in general, are technical branches of other organizations, their total employee figures have little significance, and this is also true of the engineering

***Editor's Note.** Mr. William H. Larkin, head of NSPE's Employment Practices Committee, is the Society's representative on EJC's General Survey Committee.*

colleges. The agencies, however, have 18,200 graduate engineers in their employ, and the colleges 6,800. Engineering graduates in all organizations covered, therefore, total 91,400. The organizations also giving figures for graduates in physical science have 13,100 such graduates and 60,000 engineering graduates in their employ.

The former organizations state that they employed nearly 8,000 engineering graduates in 1949 and expect to hire 5,550, or 30% fewer, in 1950. For the industrial companies, the decrease is 28% to a total of 3,825; for the government agencies, it is 33% to 1,420; and for the engineering colleges, it is 44% to 310. Decreases are characteristic of all the large industrial groups, except chemical companies, and of both federal and state agencies.

The latter organizations employed 1,500 graduates in physical science in 1949 and expect to hire 1,250, or 16% less, in 1950. For the industrial companies, the decrease is 18% to 900; for the engineering colleges, 55% to 100; the governmental agencies, however, expect an increase of 40% to 250. With smaller numbers, variations by individual industry are of less significance, but the chemical industry shows a substantial increase here also.

The estimated employment for engineering graduates includes 600 chemical engineers, 1,350 civil engineers, 1,410 electrical engineers, and 1,530 mechanical engineers, with smaller numbers from other curricula. Of the graduates in physical science, 660 are expected to be chemists, 415 physicists, and 170 trained in other related fields.

By engineering curricula, the decreases in expected employment are all of the same general order of about 30%, except that a decrease of only 5% from 1949 is expected in chemical engineering. Among physical science graduates, the employment of chemists is expected to decrease by 14%, but that of physicists to increase by 7%. In both general fields, decreases are expected at the bachelor's and master's level, but an increase of 27% at the doctor's level.

With few exceptions, the reporting organizations use the same basic starting rates for all engineering and physical science graduates at each degree level. Among the bachelors, 25% will receive a rate of $275 per month or more, 50% a rate of $255 a month or more (the so-called median), and 75% one of $245 or more. The median for the industrial companies is also $255, but the corresponding figure for the governmental agencies and colleges is $260. For organizations seeking primarily chemical engineers the median is $280; for other organizations seeking mainly civil, electrical or mechanical engineers, only small variations from the general $255 figure occur. Among industries, the highest medians are found in the chemical and petroleum companies, $300 and $290 per month respectively.

For technical graduates receiving master's degrees, the overall median is $320 per month, and this figure is also found in the governmental agencies and engineering colleges. In industrial companies, it is $5 higher. At the doctor's level, the overall median of $445 is found also in industry and government, but in the engineering colleges the corresponding rate is $390. At this level there are no significant variations in the median rates of organizations seeking men from different curricula. At the master's level, however, those employing primarily chemical engineers use a median rate of $335; those employing primarily electricals, one of $295.

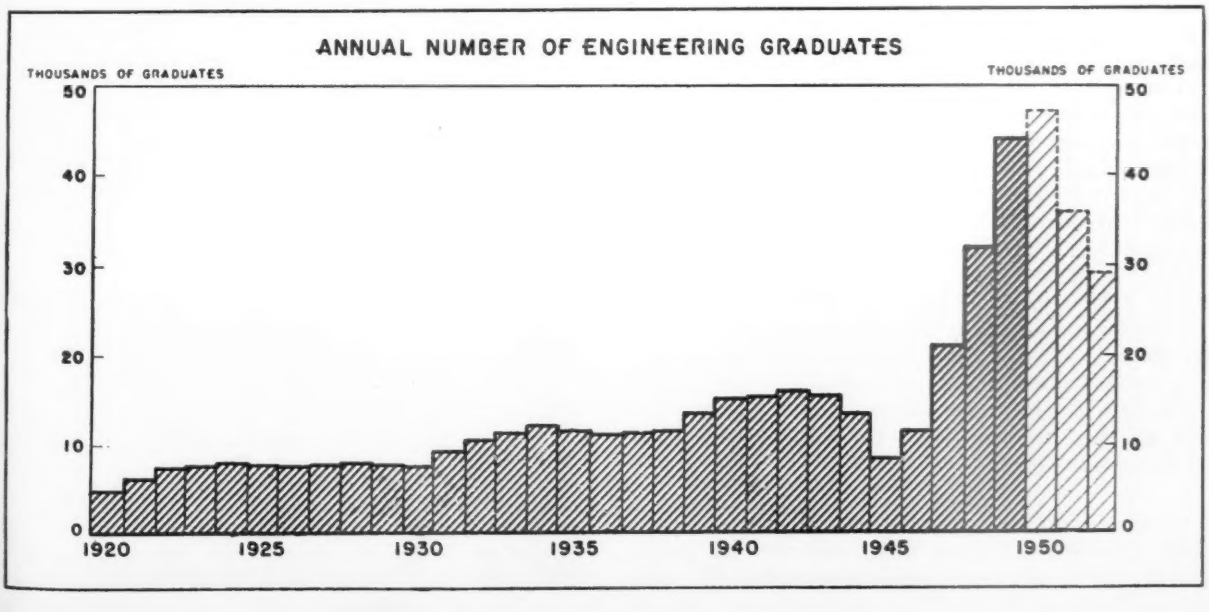
For all the organizations reporting and for the industrial companies included, the median total increase by the end of the first year of employment is $25 per month, but for the engineering colleges this figure is $20 and for the governmental agencies, $12. In all organizations, 65% give this increase at one time, 33% in two installments, and only 2% in three bites. In only one-third of all organizations, but two-thirds of the governmental agencies, is it on an automatic rather than merit basis.

Only about one-quarter of the total number of industrial and governmental organizations with 1950 quotas for engineering graduates report starting rates for graduates in business administration and even fewer a rate for those in arts. At the bachelor's level, a median rate of $250 is found for both curricula (as compared with $255 for technical graduates) and at the master's level, the medians are $275 and $270 respectively (against $320).

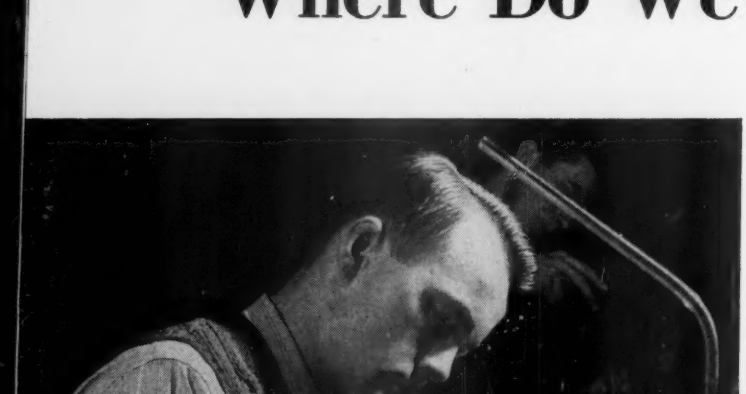
Discussion of These Findings

With respect to starting rates, the significant point is that those for bachelors have changed very little since 1949. The overall median is the same but the relatively high medians then found for organizations seeking primarily chemical and mechanical engineers have dropped $10 per month. At the master's and doctor's levels, however, the increased medians indicate a higher evaluation of the advanced training.

(*Continued on page* 30)



Where Do We Go From Here?



Today the student only worries about passing an exam; tomorrow he must face the rigors of business and social life.

Harry T. Briggs, Purdue Graduate and an Engineer-In-Training, Comments On Post-College Life

My problems as an engineer-in-training are probably similar to the ones hundreds have had to solve and are still solving, but the fact that I, as a neophyte in the profession, find myself almost overwhelmed with them may help make my description three-dimensional.

By way of background, I, like so many of my associates, had my education interrupted by the war. I can't say that that was a misfortune, however, for had it not been for the G.I. Bill, who knows whether I would have returned to school. Also, whereas my grades before the war were rather mediocre, I managed to get fairly decent grades until the last half of my senior year at which time I bought a car. College days are now past, though, and I am now with G.E. as a Test Engineer.

One of this country's educators once said, "College is like a monastery into which a young man retreats for four years to escape the responsibilities of life." I don't know where I picked up that quotation but it stuck with me because it hit the nail on the head.

All I ever had to worry about was passing an exam. Well, that wasn't always easy but at least it gave me a clear goal to shoot for.

I was led by my nose all through my college life and now, lo and behold, I discover that there are decisions to make, that I have to prove my worth if I intend to keep any position. Most of us had closed our eyes to such possibilities for at least 3½ years. All of a sudden, here I am, bobbing up and down like a wrecked ship on uncharted seas,—alone with my problems.

What are these problems, how can I solve them, what have I discovered so far?

Let us begin with the type of formal education I have received. The first deficiency which may well lie within me, is that I have not become conscious enough of the status of an engineer's profession. True, I am a member of the AIEE, a member of some honor societies, and passed the engineer-in-training exam. I can truthfully say that wearing a key unfortunately meant more to my classmates and me, than the honor and merit of belonging. One bright aspect was that the faculty at Purdue pounded into us the advantage of taking the E-I-T exam, so most of us took it.

Another deficiency in an engineering education is the deplorable lack in cultivating a good cultural background. About 90% of our contact with our fellow men is by conversation and we judge men by the manner in which they can express themselves, and by the impression they make on others. Four years are, in my opinion not sufficient. I am in favor of prolonging collegiate time to five years, putting the school on a co-op basis and including more subjects in humanities. So much for college.

Many large manufacturing companies have now created training programs for their young engineers. In a sense those programs are merely a continuation of school and yet they gently lead the greenhorn into deeper waters until at last he can stay afloat by himself. I am very glad I got into such a program because, frankly, I was scared at the prospect of earning my money and being on my own, and am only now beginning to feel my oats. Industry has taken over one of the tasks our school system has largely neglected, namely *training* for responsibility and possibly leadership.

Already have I discovered the necessity for prompt decisions, and alertness. It is one of the open secrets in engineering that technical know-how, important as it is, is by no means of prime importance. First of all I must make people want me to be with them. They don't necessarily judge me by my knowledge but by my bearing and manners. In short it's character, dependability, and disposi-

tion that count. As a corollary I might add at this point that most men out of college are simply too timid. They don't avail themselves of the opportunities offered to talk to older, more experienced men. By the way, that's the point I want to harp on. How often have I heard big shots say to us during a speech; "Come and see me any time." That's like the old famous paraphrase one slings at casual acquaintances, "you simply must come and see us sometime." Very few people accept such an invitation. Would it be asking too much if some of the executives, some of the more experienced men, took time out to meet the newcomers individually and spend an informal hour with them? Such approaches would repay many times the hour apparently lost.

WHERE am I going? In my own case, the future is most uncertain. I am still wondering what path to take. Shall it be design, application engineering, the commercial end, manufacturing or what have you. As yet, I have not had a reliable test to determine the trend of my talent although I think I like the commercial end of engineering. It would be a definite improvement in a company's training program if the trainee were forced to take an assignment in each of the above branches regardless of his initial likes and dislikes.

At this point I must not forget the desire that all of us, at least most of us, are possessed with, and that is the ultimate chance to join a small business or even start a business of our own.

Now about professional societies. They have so far been a very mystic concept to me. There is nothing concrete in them for me and hardly anyone ever orients a college student in a way to stimulate genuine interest in them. Like a northern light, they too shed their cold glow over our educational system without ever coming down to earth. They remain a far away domain to the engineering student who has merely heard about them and has then proceeded to forget about them. A little more propaganda at Universities in the good sense of the word will benefit the National Society of Professional Engineers. And, of course, the contacting of new graduates by active Society members would also get many of us thinking the right way early.

In conclusion I'd like to say that all of us greenhorns show response to certain common stimuli, and they are security, recognition, and the opportunity for new experience.

The author believes engineers must be taught to express themselves while in college. He suggests more studies in humanities.

A Trend?

Drexel To Offer Students Evening Engineering Degrees

Effective September, 1950, Drexel Institute of Technology will offer evening courses leading to the bachelor of science degree, according to an announcement by A. J. Drexel Paul, Chairman of the Board of Trustees and Dr. James Creese, Institute president.

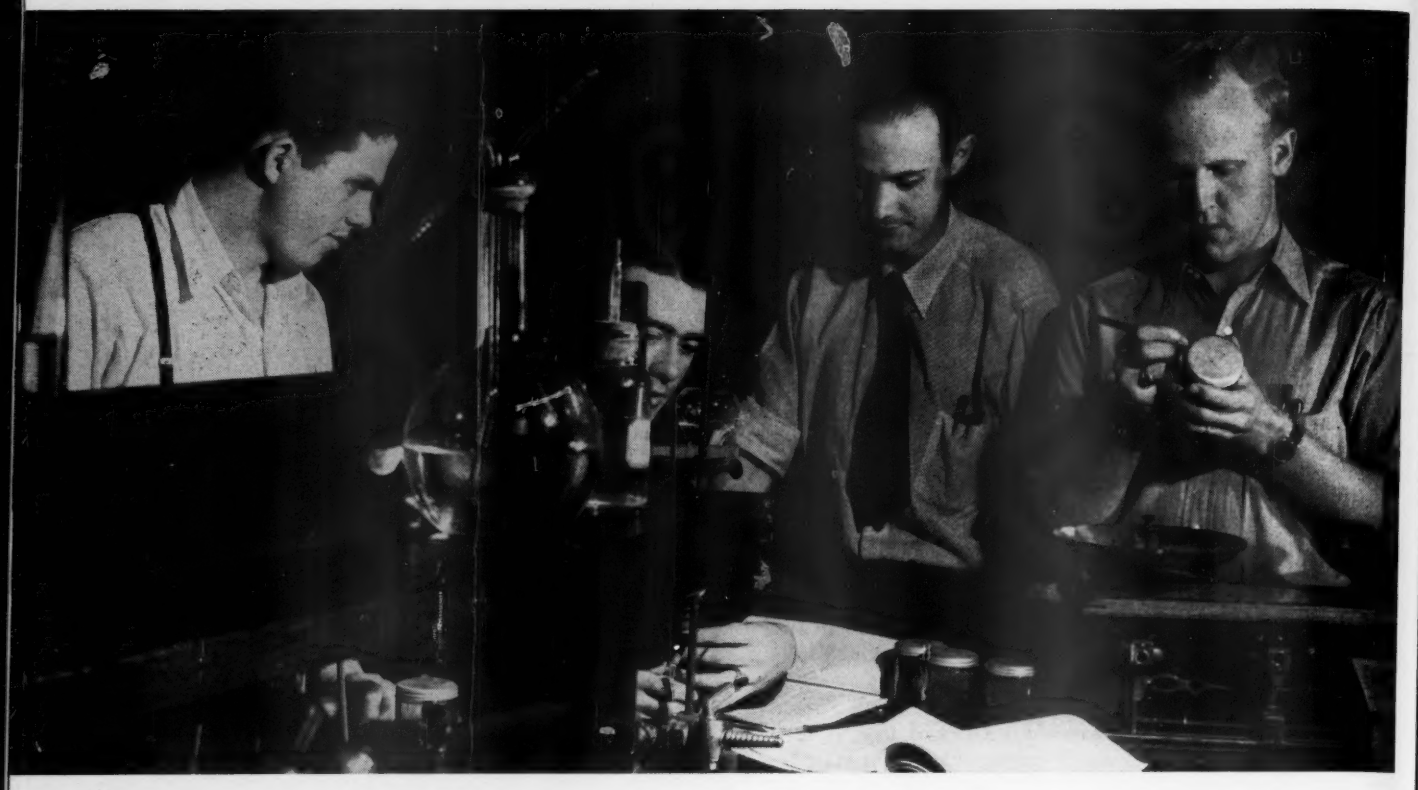
In the past, the bachelor and master of science degrees have been offered only in day courses at the Institute in the Colleges of Business Administration, Engineering, and Home Economics, and in the Graduate School of Library Science. The new evening degree course will not displace, but will build upon the six-year evening diploma courses offered previously, according to Kenneth W. Riddle, Director of the Evening College.

In the revised evening program, students can qualify for the diploma in architecture, chemical, mechanical, electrical, and civil engineering, and industrial administration by studies averaging three hours each evening, three nights a week, over a period of six and one-half years. Thereafter, qualified students may take an additional two years, making a total of eight and one-half years evening study, to obtain the bachelor of science degree.

Some 3,500 students are enrolled in the evening courses. An equal number are registered in the day colleges. Approximately a third of the Drexel day students are women. Most of the evening students are men, although evening courses are also coeducational in keeping with the original purpose of the founder of the Institute, Anthony J. Drexel. The high enrollment of men is due to the special interest in evening work in the field of engineering. It is estimated that one-third of the practicing engineers in the Philadelphia-Camden area pursued their courses of study at Drexel Institute of Technology.

The new evening degree program will apply immediately to students entering the Evening College in September, 1950, and to the presently enrolled classes scheduled for graduation in 1953, '54, and '55. These groups will, during their further course of study toward their diplomas, acquire certain credits needed for their post-diploma work toward the bachelor's degree. The graduating classes of 1950, 1951, and 1952 and all Alumni who have already completed the six-year diploma program formerly offered may, after satisfactory completion of a year's basic science review, apply for candidacy for the additional two years' work which will lead to the bachelor's degree.

Introduction of evening degree work has been under review for the past two years by a Coordinating Committee of the Institute faculty and the Evening College department heads under the chairmanship of Professor of Civil Engineering, Harry L. Bowman. The recommendations of this Committee were approved by the Institute faculty, the Board of Trustees, and the State Council on Education of the Commonwealth of Pennsylvania, because of the special need which the evening degree program met in this area.



A Great Step Forward:

THE ENGINEER-IN-TRAINING PROGRAM

By

H. L. Solberg

Head, School of Mechanical Engineering,
Purdue University

PERHAPS the most significant development during the past ten years in connection with the registration of professional engineers has been the adoption of the Engineer-in-Training program by the Registration Boards of many of our larger states. Mr. T. Keith Legare, Executive Secretary of the National Council of State Boards of Engineering Examiners, reports that the following twenty states are now certifying Engineers-in-Training:

California, Florida, Georgia, Iowa, Indiana, Illinois, Kentucky, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, South Carolina, Texas, Washington, and West Virginia.

Some states, like New York, have had the program in operation for several years and have acquired an extensive background of experience with it. In other states, the Registration Boards have adopted the program quite recently. Since the movement is new and has not been crystallized into a fairly uniform set of requirements and procedures, it is believed that a discussion of the objectives, procedures, and problems might be helpful.

The major objectives of the Engineer-in-Training program as stated by the Committee on Engineers-in-Training of the National Council of State Boards of Engineering Examiners, and published in the 1949-1950 Yearbook of NCSBEE, may be stated as follows:

"1. To make the young engineer more conscious of his obligation as a member of the engineering profession and to acquaint him with the procedure, requirements, and advantages of registration.

"2. To permit him to take the first step towards registration by passing a written examination over theory while the subject matter is fresh in his mind.

"3. To assist the young engineer in obtaining immediate professional affiliation, guidance, and protection.

"4. Through increased professional consciousness, better knowledge of the registration procedures, and reduced fear of the final examination, to encourage the young engineer to acquire professional status by registration as soon as he is legally qualified."

IN general, the procedure is to permit the graduate of an approved engineering curriculum or the non-graduate of equivalent experience, to take an examination over engineering theory as taught in the accredited engineering schools of the country, and to grant him a certificate as an Engineer-in-Training upon successful completion of this examination. Then, after he has acquired the necessary practical experience, he may be granted registration as a professional engineer either upon the basis of his record of experience or his experience plus an examination, de-

pending upon the requirements of the registration laws of the state in which he applies for registration.

It is a well-known fact that there are marked differences among the various states in the standards required for registration as a professional engineer. Also, it is well-known that the registration of professional engineers is under the jurisdiction of the individual states and is not subject to federal regulation with the result that only through cooperative effort and mutual understanding is it possible to bring about relatively uniform standards. It would be unfortunate in the development of the Engineer-in-Training movement if an equally wide variation in standards between the several states should be permitted to exist. To an increasing extent, the engineer of the future will be a graduate of an approved engineering curriculum. The self-educated engineer and the engineer who started but did not finish a full engineering curriculum will always be with us but will probably constitute a decreasing percentage of the total number applying for registration in the future. Consequently, an Engineer-in-Training program should be developed with special attention to the young college graduate.

Job Changes Likely

During the five-year period immediately following graduation, a young man is apt to change jobs more than once, and even if he is employed by the same company continuously, may find himself transferred from one location to another in different states. In the process of finding himself and obtaining a wide variety of engineering experience, he is, therefore, somewhat of a transient. It is probable, therefore, that if the young man has been enrolled as an Engineer-in-Training in one state, he will find himself a resident of a different state by the time he has obtained the practical experience necessary for registration as a professional engineer. Consequently, it is quite important that the Engineer-in-Training program be developed in such a way that uniformity of standards and real reciprocity between the several states are widely accepted.

THE Engineer-in-Training programs which are now operating may be grouped into one of the three following classes:

1. Some states grant an Engineer-in-Training certificate without examination to a graduate of an approved engineering curriculum within the state and examine only those men who are not college graduates. In general, such states grant registration as a professional engineer to college graduates without examination upon evidence of 4 years or more of satisfactory engineering experience subsequent to graduation from an approved engineering curricula. Since more and more of the larger states are now requiring an examination for registration, the value of an Engineer-in-Training certificate awarded without an examination is questionable if the candidate leaves the state in which he was granted this certificate. At least one state recognized this situation, made the examination for an Engineer-in-Training certificate optional, and recommended that the examination be taken. It was reported that 90 per cent of those applying for the Engineer-in-Training crtificate elected to take the examination, although they could be registered subsequently as professional engineers in that state without examination on the basis of a record of satisfactory experience. It may be added that in this particular state, examinations are now required for enrollment as an Engineer-in-Training.

2. Some states give an Engineer-in-Training examination at the regular time and places of the examinations for registration as a professional engineer. Also, the examination is frequently identical with the first half of a two-day examination given for final registration.

3. In a majority of the states having an Engineer-in-Training program, the examination is given on the campuses of the accredited engineering schools. The examinations may or may not be specifically made for the college graduate. When they are prepared specifically for the college graduate, they are frequently prepared by the Registration Board with the assistance of registered professional engineers on the campuses of some of the state schools and are intended to test the candidates' mastery of the fundamental principles of engineering as taught in the engineering schools.

On Campus Exams

THERE are certain advantages to giving the examination on the campuses of the approved engineering schools within the state. They are generally given to the seniors shortly before the end of their last semester in residence. They are given at a time and place which are of maximum convenience to the candidate and cause him a minimum of expense and interruption to his educational program. Suitable classroom facilities can generally be made available, and an adequate number of experienced proctors can be enlisted by employing registered professional engineers who are members of the Faculty. In at least one state where overcrowded classrooms made it difficult to schedule the examinations during normal class periods, the examinations were given on two successive Saturday afternoons and were divided into two parts of four hours each.

One of the most important advantages of holding examinations on the campuses of the approved engineering schools is the opportunity which then exists for educating the engineering students concerning the registration of professional engineers. It has been customary in most states which have followed this policy to hold student meeting which are addressed by members of the Registration Board, by practicing professional engineers, or by members of the staff who are registered professional engineers. Such meetings are usually preceded by a considerable amount of publicity in the student paper. These meetings

Experienced engineers such as these can aid the Engineer-In-Training program by welcoming the young graduate into the profession and giving him guidance.

provide an excellent opportunity to discuss with the students the requirements, procedures, and advantages of registration, the professional aspects of engineering, and the privileges and responsibilities of the engineer as a member of his profession. Where such a procedure has been followed, from 60 to 80 per cent of the graduating class have taken the Engineer-in-Training examination. This result is most gratifying when it is considered that many students are studying engineering courses as preparation for general business activities and have no intention of following the practice of professional engineering as a career. It has been stated from time to time in the technical press that engineering students are ignorant of the professional aspects of engineering and their duties and responsibilities as members of the engineering profession. It is believed that the Engineer-in-Training program can be so organized as to overcome this deficiency to a considerable extent and actually give the young engineer the opportunity of taking the first step towards full professional status through the passing of an eight-hour examination and enrollment as an Engineer-in-Training.

Model Program

In order to promote uniformity in standards among the several states and thus make reciprocity a possibility, the Committee on Engineer-in-Training of the National Council of State Boards of Engineering Examiners recommended at the twenty-eighth annual meeting of NCSBEE in November, 1949, that the following "model" program be recommended to the several state Boards as a guide in the development of their individual programs:

1. *Written examinations required*: Enrollment as an Engineer-in-Training should be based upon a written examination given to graduates and seniors about to graduate from approved Engineering curricula and to non-graduates who in the opinion of the respective State Boards have had experience and/or education equivalent to that obtained through graduation from a standard 4 year Engineering curriculum.

2. *Type of examination.* A written examination should require one day of 8 hours. It is suggested that from 50 to 70% of this time be devoted to the common basic subject matter of all Engineering curricula, including mathematics, chemistry, physics, engineering drawing, and engineering mechanics. In order that the examination may adequately cover the usual subject matter of the Junior and Senior years, it is recommended that the remainder of the time be devoted to examinations specialized by major Engineering curricula and covering the usual subject matter of the Junior and Senior years in these curricula.

The examinations should be prepared for the college student who is near the end of the last semester of his senior year. Emphasis should be placed on fundamentals and questions should test the student's analytical ability rather than his memory. Most of the examination should be of the open-book type, and the examination should be long enough so that the student may use his books as reference material but will not have time to study. There should be a sufficient choice of questions so that the graduate of any first-class engineering school may find a reasonable set of examination questions.

It is suggested that the examinations be prepared with the assistance of registered Professional Engineers on the faculties of the engineering schools in the state to insure a type of examination which will meet the standards required by the Registration Board and still be as fair as possible to the properly qualified college senior.

3. *Time and place of examination.* It is recommended that where conditions permit, the examinations be held on the campuses of the approved engineering schools within the state, as well as at the usual headquarters or other examining places of the Board.

It is suggested that the examinations be given from 3 to 6 weeks before the date of graduation. This will avoid conflict with the regularly scheduled University examinations for which students are preparing during the last few weeks of the semester and will at the same time place the examination late enough in the student's academic career so that practically all of his course work can be covered by the examination.

Publicity and Fees

College teachers who are registered Professional Engineers may be enlisted to proctor the examinations and also to grade the papers under the supervision of the Board. They should be paid for this service.

4. *Publicity.* In order to fulfill as completely as possible the objectives of the Engineer-in-Training Program, a carefully worked out *educational* program should precede the Engineer-in-Training examination. The responsibilities of the young engineer as a member of the engineering profession and the requirements and procedures for registration should be carefully presented to the student body by members of the Registration Board, by prominent Registered Engineers who are practicing in the state, or by members of the faculty who are Registered Professional Engineers. Dean Dougherty's pamphlet on "*Registration of Professional Engineers*" might very well be distributed to the students and discussed with them. This should not be a selling program, but rather an *educational* program. It should emphasize that the Registration Board is giving the students an opportunity to take the first step toward registration at a time and place which is most convenient to them.

5. *Fees.* Since there is an excellent prospect that the young Engineer-in-Training will be living in a different state when he is eligible for registration, and since the objective of the program should be registration in the state of residence, the fee should be kept to a minimum. It is suggested that a fee of $5.00 should be adequate to cover the cost of administering the program, and such a fee will not be burdensome to the average candidate.

It is suggested that the members of the National Society of Professional Engineers can be particularly helpful in developing the Engineer-in-Training program by

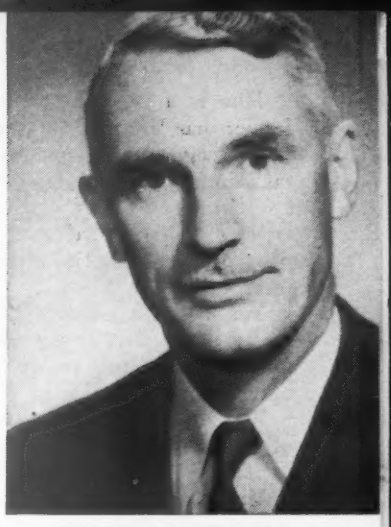
1. helping to obtain legislative approval of changes in existing laws where changes are necessary in order to initiate the Engineer-in-Training program or to bring it into closer agreement with the practices in effect in the majority of states, and by

2. welcoming the Engineer-in-Training into the engineering profession, encouraging him to affiliate with the Society as an associate member, giving him guidance, and assisting him in becoming registered as a professional engineer as soon as he is legally qualified.

It is believed that if the Engineer-in-Training program is developed over the next decade in such a way as to bring the examination to the young man about to be graduated from our engineering schools and if the educational opportunities inherent in such a program are utilized effectively, the young engineer of the future will be fully informed concerning the requirements and advantages of registration, will be more conscious of the professional aspects of engineering, and will have completed the first and most difficult step toward registration as a professional engineer. It should be a significant factor in the development of the engineering profession.

About the Author . . .

Carl A. Poppino, a member of the Arizona Society of Professional Engineers, received his B.S. in E.E. at the University of Kansas in 1926. Since that time he has been employed by General Electric in various capacities. After a year of publicity work in New York City he headed offices in Colombia and Venezuela. Since 1936 he has been a sales engineer serving in Chicago, Minneapolis, Phoenix and Bakersfield. When he is not writing, his spare time is spent hunting and fishing.



Carl A. Poppino

Culture And The World We Live In

By

Carl A. Poppino

THE word culture, to most engineers, carries a faintly odious connotation. It is something slightly unclean, the mark of a pansy, a sort of minor curse to be shunned like acne, or the itch, or a deficiency of Vitamin B. This is all most unfortunate. Engineers as a class need to regard culture highly.

Why should engineers have an aversion to culture? Well, it would seem only natural that this be so. The utilitarian and the cultural life are in eternal conflict. Immersed constantly as we are in purely physical concepts, it is only with extreme difficulty—by a supreme effort, actually—that most of us can progress in a cultural direction. We are enormously beset by the devil of immediacy. We are doers, not dreamers. And not only does the very nature of our work hamstring us in our cultural development; we are further boxed and circumscribed by the whole intellectual climate of our present severely material civilization.

The newspaper—long a popular hub of the community's cultural wheel.

What is culture?

One version is given by a character in one of J. R. Williams' cartoons: "Culture is a guy who can't bear to kill a chicken but don't mind stuffin' hisself with it."

This is amusing and has some horse sense in it. But it is hardly accurate. I think the intriguing part of it (and the general aversion engineers have to culture) arises from what the professors call dilletantism—a silly exaggeration of the pleasures derived from cultural things; a pseudo-culture, a shadow-without-substance, the outward form without an inner core of sincerity.

Culture is not knowledge, not education, not erudition. It is not polish, not outward show, not sophistication. It is not etiquette, not superficial refinement, not social prestige. It is a fine synthesis of these things, plus much, much more.

Culture is akin to the enjoyment of a landscape apart from the geology of the terrain. It is the spirit which views the field of knowledge with more sense of appreciation than analysis.

Culture is a familiarity with, a fondness for, and a sensitivity to the *fine*.

Culture is a state of mind, a course of consciousness which a man must cultivate within himself.

Well, enough of definitions! What is the *meaning*, the significance, of culture? That is hard for us to get at. We cannot see, hear, feel, taste, or smell it. We cannot express it in finite terms. We cannot measure it by any known yardstick. It is nebulous, imponderable, hence it is not amenable to the application of formulæ. Yet, in our industrial democracy, culture is a profoundly acute economic and ethical problem. It is not, in these times, remote or academic. It is here, now, and will not wait for some vague, never-may-come tomorrow.

Engineers, as a class, are deficient in culture as we have here defined it. They are generally intelligent, most are sincere, many are polished; but only a few are, in the finer and broader sense, cultured. Few have the inner resourcefulness, the high quality of refinement, the intellectual and esthetic appreciation of life that distinguish and motivate cultured man.

This is a serious, even horrifying, charge. The profession has brought us a degree of comfort and physical well-being we have never before known. It has awarded man an amount of leisure not hitherto imagined. The knowledge of nature and degree of control over her that we now have is almost beyond comprehension. And progress in material things grows at a geometrical rate.

Yet, it is an unhappy fact that we engineers are dismally ineffective in the field of social science. We have done our one job so well, that we have neglected our other responsibilities in a manner "most utterly utter."

Well, suppose we are mere slip-stick slaveys, apostles of two-plus-two, high priests of the holy formula? What of it?

More hangs on that than I have words to say.

Not only are we now faced with the possibility of complete economic and political disaster; we have before us constantly in this great age the appalling chance of total, final oblivion. What contribution can men of surpassing skill in technics—and sorely limited talents in other fields—make toward solving so immense a problem? The sad answer is—pitifully little!

These Dangers Are Real

Do you doubt that we are in any considerable danger of falling to lock-step totalitarianism? Do you question the need for any change in our collective outlook? Do you feel that the atomic threat is a figment of a diseased imagination?

I quote W. C. Mullendore, President of Southern California Edison Co.: "I am an alarmist—an unashamed and unapologetic alarmist." And like Mr. Mullendore, I quote Jose Ortega y Gasset, the Spanish philosopher: "I wish it would dawn upon engineers that, in order to be an engineer, it is not enough to be an engineer. While they are minding their own business, history may be pulling away the ground from under their feet."

The author believes that engineering courses should be 5 or 6 years in length, and include studies in the liberal arts.

Oswald Spengler, in "Man and Technics," gloomily prophesies:

"This machine-technics will end with the Faustian (Western) civilization and one day will lie in fragments, forgotten—our railways and steamships as dead as the Roman roads and the Chinese wall, our giant cities and skyscrapers in ruins like old Memphis and Babylon. The history of this technics is fast drawing to its inevitable close."

Forces beyond our control, we may say, impelled us to bring into being the great powers that have been unleashed. Are we to blame for the laws of economics, the idiosyncrasies of politics, the surges of material progress that have ebbed and flowed through all history? We have faithfully performed our work and nobody could have done better.

Maybe so. Maybe we have all conscientiously kept our hands to the plow, done our best by the wife and kids, applied our brains to the highest degree, and put in plenty of overtime.

Well, if a man stands unarmed before a charging elephant, does he meditate on who is responsible for his being there? If civilization points a cannon at us, do we hope to escape by cocking a finger at somebody else and screaming, "He done it!"?

The instinct of survival is still lusty in us—I trust. The energies we have poured out in scientific progress are not wholly spent. The keen intelligence we displayed in reaching our present Parnassus of achievement surely has not been suddenly eclipsed by a mental collapse.

I think we have become a little too much mechanized mentally. We see our machines performing their functions with mathematical nicety. We behold their utter efficiency, their lack of indecision, their precise marching toward their goal—output. They waste no energy in emotional tizzies. They are not deviated from their object by impulses of thought or disturbances of conscience. They serve their severely materialistic purpose in a manner marvelous to observe. We are enthralled by their capacity for supplying the world with the bounties man has craved time out of mind.

Little wonder, then, that we are profoundly affected by it. Our thought processes tend toward the mechanistic. We suppress our emotions. We strive to emulate the machine in ordering our life processes. We impose on a delicate, sentient, imperfect amalgamation of body-mind-spirit an impossible requirement—that it emulate an ingeniously contrived assembly of unfeeling metal parts.

I deplore this mechanization. We are not machines. We are men. We should treat ourselves as such. Probably a considerable part of the serious malaise that afflicts society today arises from this source.

More Emotion, Humanity Needed

I would plead for more humanity in our engineering. It is all very well to rest upon our axioms, postulates, self-evident truths, mathematically demonstrable conclusions. It is very fine to hypothecate and theorize, and build towering edifices of scientific half-truth upon them. But let us be human about it. Let us not forget that there is in each of us a quality of being far more worthy of our earnest solicitude and meticulous cultivation than the vast but soulless world we have built from mathematics, biology and physics. As Mr. Mullendore says, ". . . all these wonderful gadgets and devices . . . are after all not an end in themselves but merely tools to be used by man in the improvement and development of

(*Continued on page* 33)

Accent on Activity

NSPE IS BEGINNING TO MOVE ON A NEW PUBLIC RELATIONS PROGRAM. Regularly scheduled **publicity releases** are now going out to newspapers, wire services, technical magazines, etc. State societies will also receive. ANOTHER PROJECT NOW IN GEAR IS A PUBLIC RELATIONS NEWS LETTER. **Objective:** To assist chapters in publicizing NSPE and the engineering profession. First NEWS LETTER will carry complete 15-minute **radio program** to be adapted for local use.

EVERYONE IS MEMBERSHIP CONSCIOUS. In addition to 13,000 pieces of first class mail received by NSPE HQS during first quarter, there were 7,000 individual requests for membership brochure, "Man Was Naked." . . . States report return of 10% on mailers they have sent out affording registered engineers an opportunity to get "Man Was, etc." Many of those interested are ultimately signed up. NEW JERSEY **made members of 30% of those who sent card back** . . . States can still arrange with HQS NSPE to print attractive membership-getting brochure for them. GET MORE INFO NOW . . . **NSPE membership now over 22,000.**

AMERICAN ENGINEER ADVERTISING CAMPAIGN IS ROLLING. New advertising representative for Mid-west area is: **William R. Stewart, 9 South Clinton St., Chicago 6** . . . JUST OFF PRESS is new piece to be sent to prospective advertisers. Folder is cleverly conceived including Big League Baseball schedule. **Folders available to any member interested.**

NSPE ADMINISTRATION BRIEFS: Certificates and plaques of recognition being developed. They will be for presentation to **past officers of chapters and state societies** . . . New additions to CHAPTER HANDBOOK will soon go out. **Those with handbooks watch for them** . . . Copies of "EMPLOYMENT OUTLOOK FOR ENGINEERS," issued by Bureau of Labor Statistics, are available from HQS NSPE for 50c. **A copy for membership use has also gone to each State Society Hqs.**

COSMOPOLITAN FLAVOR AT HQS. Callers at Wash. office recently came from 4 corners of globe. Several **Britishers** dropped in to talk registration, etc. From **Japan** came Dean Seiji Kaya of Tokyo U. and party. In from **Turkey** was Turk gov't. construction engineer to discuss fees, employment.

AT HEADQUARTERS, NSPE: Executive Director called on Assistant Postmaster General to **protest the use on a new stamp of the term engineer to describe a railroad engineman** . . . Another conference was with **Bureau of Reclamation officials** to clarify policy on competitive bids for professional services . . . NSPE has suggested to National Board of Fire Underwriters, the Pacific Coast Building Officials Conference, and the Southern Building Code Congress that they include in Model Codes statement that **plans and specs carry signature and seal of registered engineer and/or architect** . . . NSPE has again testified in favor of a D.C. registration bill . . . LABOR ACTIVITY AGAIN DRAWS ATTENTION. Several engineering groups concerned with labor organization activities have called on HQS NSPE for **info on professional employee status.**

ON LEGISLATIVE FRONT: NSPE has protested to the Senate's Committee on Foreign Relations re **$50.00 maximum per day fee for engineering consultation as now called for in pending Point 4 legislation.** NSPE wants to go to $100. Also recommended was that a **professional engineer** should head the group to administer the program (Institute of International Cooperation). Further, it was pointed out that **engineering representation should be on the advisory body** to consult with the president and program's administrator. Present bill calls for such a body . . . NSPE ALSO DENOUNCED President Truman's recommendation that Advance Planning Program be transferred from Bureau of Community Facilities, General Services Administration, to the Housing and Home Finance Agency.

BRIEF AND IMPORTANT. NSPE's Past Pres. Van Praag attended another Inter-Society meet . . . Ex. Dir. Robbins lists among speaking engagements: students at Rutgers U, and the Annual Banquet, Conference of Utility Commission Engineers in Washington.

PROFESSIONALISM—IN RETROSPECT, A DUTY

(EDITOR'S NOTE: *The following is an editorial from the "Georgia Tech Engineer," written by Editor Dave Crane. Dave, a winner of one of Tau Beta Pi's coveted fellowships this year, is featured on our cover this month.*)

" 'Tis the toime of Saint Patrick, and, as all kane see for themselves, 'tis a glo-r-r-ious past thet the knoights of Saint Patrick hev writ i' the sands of toime'."

Why the lore of engineering depicts the engineer as an Irish disciple of the venerable sage who engineered the snakes out of Ireland is a matter which only engineering students of the University of Missouri, 1903 vintage, could explain! But one thing that is certain is that the profession of engineering is most deeply rooted in an honorable and memorable past. There has been through the ages a narrow line of demarcation to distinguish the engineer from the scientist. But to the pioneers in both engineering and science we owe a debt of gratitude, and, as engineers, we are faced with the responsibility of maintaining the high standards of ethical concern for human welfare evidenced by the forefathers of our profession.

LEGAL CONTROL NEEDED . . .

Three professions, medicine, law, and engineering, have been charged with the responsibility of protecting and improving the life, health, rights and property of human beings. Modern society has found that the competent fulfillment of these duties must be ensured by legal control over methods, materials, and men. Likewise, engineers are finding that their own rights to a "good name," so necessary to obtain the trust of laymen, are being infringed by those who hold themselves out to clients as being professionally competent engineers when, in fact, their claim is based on some technical skill acquired through specialized experience.

Harry W. Lundin, of Hill and Knowlton, Inc., New York, public relations consultants, had this to say in an article appearing in the February, 1949, issue of THE AMERICAN ENGINEER: "Today, you are in the embarrassing position of pleading for acceptance from a poorly informed public which knows only that engineers have robbed personality and dignity from the individual, and made him second in importance to his machine, his product, or the services he provides. It is unrealistic, then, to expect that engineers can win the recognition they desire without materially improving their present public status." Mr. Lundin went further into the problem in stating that, in a public opinion poll, the profession ranked a poor seventh, tied with government employees, in a field of eleven groups purported to have contributed most to everyday living! Is it not alarming to find that the majority of American people do not know that the credit for their refrigerators, telephone service, automobiles, and the medical aids required by doctors to care for their health belongs to the engineer? Is it surprising that the people of Georgia have allowed Georgia Tech to become "the largest publicly owned and privately supported" educational institution in the world?

ENGINEERS OWE DEBT . . .

To the glorious past of engineering and science and to the future which may promise more abundant human welfare, engineers owe a debt and have a responsibility for keeping the public informed of the manner in which they serve. If engineers do not "blow their own horn," it is certain that no one else will. Matthew Wohl, a leader of the A.F. of L., told a group of Harvard engineers, "The trouble with you engineers is that you fancy yourselves as professional men. Actually, you are just hired help." Labor would seek to classify engineers as laborers; capital would seek to use your skills for profit at your expense, rather than in an ethical approach to the betterment of mankind. Laymen will see the direct personal interest evidenced by doctors, teachers, and ministers and discredit you as professional men.

In the summing up, the problem of furthering engineering professionalism seems to be divided into three phases: professional restriction and assurance of competence, widespread indoctrination of ethical principles in the fulfillment of social responsibilities, and a concerted effort to secure the respect of laymen through a public relations program. Out of 199,000 American doctors, 100 per cent are registered and organized; of 180,000 lawyers, 100 per cent are registered and duly bound by communal ethics; of 290,000 engineers or would-be engineers, 140,000, or 48.3 per cent, were registered in 1949. Many of them belonged to hundreds of different professional and technical organizations, but there was and is no national organization which can be said to represent the entire body of U.S. engineers. All of this group of 290,000 engineers do not deserve the professional status which registration and good organization designate; but, for those who do deserve the professional status and are qualified to practice engineering, it is imperative that they be proved in the eyes of the layman. After better organization and the weeding-out of incompetents has taken place, then, and only then, will the layman give the engineer credit for his efforts in using the "properties of matter and the sources of power" for the welfare of human beings and the attainment of the ultimate good in life.

PRIZE WINNING ESSAY . . .

(EDITOR'S NOTE: Earl Dennis, whose Tau Beta Pi essay appears below, is a senior in chemical engineering at Vanderbilt and hails from Columbia, Tennessee. Besides Tau Beta Pi, Earl is a member and president of the student chapter of the A.I.Ch.E.)

When we stop to compare the engineer with other professional men, we are quick to notice the difference in education. At the bottom of the list in the number of required college credits stands the engineer. Could this be because he is smarter or can learn

faster than other professional men? Is it because his field is more simple than other professional fields? Or is it because his education has actually been shortened to the extent of neglect, neglect not only in principles of his own field but also in the basic principles of a general education?

Several of the engineering schools of our country have recently initiated the five-year college training program for engineers. This was not done with the idea of discouraging prospective students in the field of engineering, nor was it done for the purpose of fattening the pockets of the schools involved. The five-year plan was proposed and established because certain men have realized the limitations placed upon a four-year graduate and have attempted to relieve the engineer of these limitations.

5-YEAR PLAN . . .

In certain instances the five-year plan has been introduced as a means of lightening the term credit load of the engineering student. Under these conditions the plan can be of little value to the student. The plan in its proper light is set up to provide a broader education for the engineer and to better qualify him to compete in the professional world. As long as we are willing to keep sub-standard requirements intact, we are preventing the engineer from reaching a standing equal to that of the lawyer, doctor, or dentist.

In practice we often consider ourselves as obtaining a pre-engineering training during our four years of college. We then do our professional study in the practical field. This practice is especially desirable to the organization employing the engineer, but in this light it is an extremely selfish motive. The large corporations want their engineers trained in a special job for efficiency. They also had rather that he did not obtain information on other processes that might make him potentially desirable to another company. We must not overlook the value of experience as a teacher; but we must also recognize that to take proper advantage of experience we must know the underlying principles of theory.

MORE COLLEGE . . .

In all the fields of engineering there is ample material on theory and basic applications to fill easily another year of college. Needless to say, we could fill several more years of college. It is this large quantity of "left-over" material that makes a five-year training program not only plausible but absolutely necessary. If, however, we add another year of college, it will no doubt be advisable to consider some of the previous material which we have skimmed over in our regular courses, rather than some new material. The average student would receive more value from several courses of seminar level than a maze of courses on new theory.

The desirability of a five-year plan is evident. The success of such a plan must lie with the engineering student, however. Will he be willing to accept it? He also can see the advantages, but is he willing to put out the extra work necessary in a fifth year of college? Alas, we are all too eager to accept the "get by" course, and refuse to improve our profession, unless it can be done at the expense of others. As long as a majority of the engineers in this country can earn a living in the unorganized, sub-standard profession that we have today, engineering will remain at the bottom of the ladder in required college credits, and the members of the profession will continue to overlook the rewards that could be theirs.—*from "V-Square," Vanderbilt U. Engineering Magazine.*

ABOUT LONDON'S ENGINEERS' GUILD . . .

The objects of the Engineers' Guild (London, England) as laid down in its Constitution are "to promote and maintain the unity, public usefulness, honour and interests of the engineering profession" and its declared *immediate* objectives are:—

1. Representation of the engineering profession at the highest levels of planning, control and direction.
2. Acceptance of engineers as eligible candidates for the most responsible administrative posts.
3. Protection of the public from unqualified practitioners, and reservation of work for those qualified to do it.
4. Recognition and adequate remuneration of the services of engineers at all levels.

ONE OBJECTIVE . . .

One of the main objectives will be to establish and maintain the status of the engineer as a member of one of the major professions. This is something which has been neglected for years, for which engineers, due to their own apathy have suffered greatly. Such a title as that of "Professional" or "Chartered" Engineer, must become as commonplace and as well defined as that of Barrister or Chartered Accountant. Because of this important aspect of the Guild's function, it is necessary to define rigid conditions of membership. For this reason membership of the Guild is restricted to Chartered Civil, Mechanical and Electrical Engineers, since Corporate Membership of one of three premier Engineering Institutions provides a very good and a widely accepted standard for judging the qualifications and capacities of an engineer.

The need for a central organization which can concern itself with the maintenance of adequate standards of remuneration has long been felt, but it is considered that this very important activity of the Guild must be carefully handled so that it shall not become the pre-eminent concern, as has happened in the case of the trade unions. It is felt that the best service the Guild can provide for the profession is through its endeavor to establish a high professional status for the engineer, based on his integrity and value to the community. An informed, virile and socially conscious profession is the best assurance of adequate recognition and appreciation.

NOT TRADE UNION . . .

The Engineers' Guild is not a trade union. It was decided after a full investigation into all the "pros and cons" that registration under the Companies Act, the form of incorporation adopted by the B.M.A. and the B.D.A., was the best method of attaining the objectives of professional engineers, and proposals to this effect will shortly be placed before the membership for approval.

On the soundness of these objects the majority of professional engineers will agree, but it is for engineers to provide the wide and united support which is imperative for effective action.

During the last year events have been moving fast and the structure of the Engineers' Guild is taking shape. The Membership is approximately 3,000, but the full Corporate Membership of the three Institutions is at least 35,000! This is a gap which must be bridged and bridged soon.

Sir Stanley Angwin, Past-President of the I.E.E., has said that "all present and prospective Chartered Civil, Mechanical and Electrical Engineers should join and actively support the Engineers' Guild."

Strong support is needed now to promote strong action—your support and the support of tens of thousands of engineers who want their profession to occupy its rightful place in society.

Your membership, your opinions and your experience are urgently needed.—*"The Journal of the Engineers' Guild."*

A statue of Paul Revere with Old North Church in background.

Combine An Interesting Meeting With a Glorious New England Vacation at

NSPE'S ANNUAL MEETING IN BOSTON

By

Edgar A. Harty

President, Massachusetts Society of Professional Engineers

THE 15th Annual Convention of NSPE is to be held in Boston, Mass., June 8, 9 and 10, 1950. The Massachusetts Society of Professional Engineers cordially invites you to attend the convention and, if possible, stay longer and enjoy a New England vacation.

The general sessions of the convention at which the official business is transacted are open to all members, although only the official delegates are permitted to vote. These sessions have always proved most interesting. The subject matter to be discussed at each session will be announced later in the AMERICAN ENGINEER.

The convention program published on pages 21 and 22 provides ample attractions for all. The principal speaker at the dinner meeting on June 8 is Carlton Rogers, whose wealth of romantic tales of New England makes him an ideal interpreter of this corner of our country. His travelog will set the stage for those preparing to take a vacation after the convention. Speakers at the June 10 gatherings include such well-known engineers as General Lewis A. Pick and Dr. David B. Steinman. United States Senator Henry Cabot Lodge will also address the convention. It is unnecessary to say that each of these outstanding men will have a real message for us.

Historic Boston and the surrounding countryside provide a sightseer's paradise. Two conducted tours have been arranged for the afternoon of June 9. For those wishing to concentrate on the city itself, with a little time left for independent searching, a two-hour trip can be taken to such spots as Paul Revere's home, Old North Church from which the lanterns were hung, the scenes of the Boston Tea Party and Massacre and others too numerous to mention. A longer tour has been arranged for those who wish to see something of the rugged shore north of Boston, visiting the witch city and early seaport of Salem, with its famous "House of Seven Gables" and "Pioneer Village," the ancient and lovely port of Marblehead, and other towns along the shore including Swampscott and Lynn.

In addition to these trips, several special events have been scheduled for the ladies. One of these is a visit to the former home of Mrs. Gardner, now a unique museum in the heart of Boston. This visit includes a concert and tea, which in the setting of this fabulous home will assure fond memories for years to come.

ANOTHER trip for the ladies includes the famous Wayside Inn at Sudbury, restored by Henry Ford a generation ago. Here is to be found an old grist mill which grinds meal between old stones driven by a waterwheel. The little red schoolhouse of Mary and her little lamb is here, as well as the inn itself where the great intellectuals of a century ago gathered to exchange ideas. Luncheon will be served at this or one of several other equally famous old inns. This trip will also include visits to charming and historic Concord and Lexington, two beautiful towns held dear to all Americans for the important part their famous people played in our early history and literature.

No visitor to Boston in late spring and early summer should miss a "Pops" concert given by the world famous Boston Symphony Orchestra. These concerts are unique in that they are conducted by Arthur Fiedler, an outstanding conductor, played by musicians whose individual talents are rarely excelled, but rendered in an informal atmosphere of relaxed enjoyment. Wine, beer and pop, as well as sandwiches, are served at tables on the main floor

during the concert, and the musical selections themselves are the light and melodious classics even the least musical of us can enjoy. Needless to say, an Engineer's Night at the Pops has been included on the program. Make your reservations early. This will be a most popular event, and last minute reservations are almost impossible to obtain.

THE convention will close with a banquet, entertainment and dancing on Saturday night. Those who can stay a few days to enjoy New England "on their own" can be assured of a happy vacation.

In addition to Boston and its attractions, New England contains 36,000 square miles of vacationland. There are four major mountain ranges. Over 2,500 miles of sea coast, with 1,000 sandy beaches. Four thousand miles of mountain trails for hikers and climbers. Hundreds of beautiful lakes set in friendly green valleys. Hundreds of stopping places, from friendly farm houses and overnight camps to huge resort hotels. Thousands of miles of smooth highways winding through the charming and inspiring landscape.

All along the coastline are the ports, great and small, that once saw the lovely clippers and the far-roving whalers—ports that now send out fleets of fishing and merchant vessels and amateur sailing vessels of all sizes and classes.

New England country villages are an experience in themselves. They are of one kind in the southern part—Connecticut, Rhode Island and southern Massachusetts; of another kind farther up, in Vermont, New Hampshire and Maine. Each has its white-spired church; many of them have village greens; most of them conceal a quitely distinguished hotel and restaurant.

Many people enjoy New England by merely traveling leisurely about and looking at the lakes, mountains, or sea coast. Both landscapes and recreational activities are full of interest. On a "play-as-you-go" policy, there is a whole catalog of sports to indulge in. Golf reaches its peak in New England. All kinds of courses, kept at their best by the moderate climate, and set in varied countryside attract the player. Hundreds of paths and trails branch out from main highways and lead to hidden cascades, high mountain lookouts, and primeval woods.

YOU will be interested in the food New England eats—dishes and ways of serving them that defy imitation. A boiled dinner of fresh garden vegetables and corned beef; sea food as it can be had only in New England—tender broiled lobster, delicious steamed clams, the humble salt cod made into half a dozen fabulous dishes, oysters and scallops with the fresh tang of the sea itself—fish of a score of varieties. Then there are the renowned baked beans and brown bread with spicy country relishes; pies made where Pie is King; griddle cakes with mellow amber maple syrup.

The cooking, the landscape, the architecture, the history all go to make up the way of life comprised in the words "New England."

Ladies' Program

Thursday, June 8, 1950

12:30 PM

Luncheon. Engineers and their Ladies.

2:00 PM

Ladies' Tour, Concert and Tea. Isabella Stewart Gardner Museum. Ladies' Tea at the Museum with Ladies' Committee on arrangements acting as hostesses. Complimentary to wives of NSPE members. Attendance limited to 100.

7:30 PM

Dinner and Travelog. Engineers and their Ladies.

Friday, June 9, 1950

12:30 PM

Luncheon. Engineers and their Ladies.

1:30 PM

Sightseeing Tours. Engineers and their Ladies. (Choice—see Program.)

8:30 PM

"Pops Concert." Engineers and their Ladies.

Saturday, June 10, 1950

9:00 AM

Ladies' Sightseeing Trip. Gore Mansion, Wayside Inn, Lexington and Concord. Luncheon at an outstanding Inn.

12:30 PM

Luncheon. Engineers and their Ladies. (Ladies who do not go on sightseeing trip may attend Luncheon.)

7:00 PM

Reception, Banquet, Entertainment, Music and Dancing. Engineers and their Ladies.

Hotel Reservation Form—Also See Page 23

Annual Meeting
NATIONAL SOCIETY
OF PROFESSIONAL ENGINEERS
June 8, 9, 10, 1950
at
Hotel Statler—Boston, Massachusetts
HOTEL RESERVATION

Please reserve accommodations as checked (√) below:

Name .....
(Please Print)
Address .....
City ..... State .....

Unless requested otherwise, we will hold your reservation until 6 p.m. of the day of your arrival.

Date Arriving ..... A.M. P.M. Hour.....
Date Departing ..... A.M. P.M. Hour.....

Room and Bath For One — Per Day	4.50 ☐	5.50 ☐	6.50 ☐	Double-Bed Room with Bath For Two — Per Day	8.00 ☐	9.00 ☐	10.50 ☐
	4.75 ☐	6.00 ☐	7.00 ☐		8.50 ☐	9.50 ☐	12.50 ☐
	5.00 ☐	6.25 ☐	8.00 ☐		8.75 ☐		
			10.00 ☐				

Twin-Bed Room with Bath For Two — Per Day	10.00 ☐	11.50 ☐	15.00 ☐
	10.50 ☐	13.00 ☐	16.00 ☐
	11.00 ☐		

More Than Two Persons in One Room
For each additional person in Double or Twin-Bed Room the extra charge is $2.50 per day.

SUITE—Living Room, Bed Room and Bath
For One 17.00, 18.00, 21.50, 23.00
For Two 20.00, 21.00, 22.00, 24.50, 28.00

If a room at the rate requested is unavailable, one at the nearest available rate will be reserved.

Please mail to:
MR. D. B. STANBRO, Manager
Hotel Statler
Park Square at Arlington Street
Boston 17, Massachusetts

You're Invited By The

MASSACHUSETTS SOCIETY OF PROFESSIONAL ENGINEERS

To Attend

NSPE'S ANNUAL MEETING IN BOSTON

JUNE 8, 9, 10, 1950

Headquarters: Hotel Statler

Program

Thursday, June 8, 1950

8:30 AM
Registration begins.

9:30 AM
NSPE General Session. Society Members and guests invited.

12:30 PM
Luncheon. Guest speaker to be announced. Engineers and their Ladies.

2:00 PM
NSPE General Session. Society Members and guests invited.

2:00 PM
Ladies' Tour, Concert and Tea. Isabella Stewart Gardner Museum.

7:30 PM
MSPE Annual Dinner, presentation of Officers for 1950-1951. Music, Travelog on Old New England by Carlton Rogers, Past President of Lynn Historical Society, Engineers and their Ladies.

Friday, June 9, 1950

9:00 AM
NSPE General Session. Society Members and guests invited.

12:30 PM
Luncheon. Engineers and their Ladies.

1:30 PM
Sightseeing Tours. Engineers and their Ladies.

(a) Historic Downtown Boston—2 hours
(b) North Shore Trip—Salem, Marblehead, Lynn, Swampscott. House of Seven Gables, Pioneers' Village, Witch City Salem, Spirit of '76 painting in Marblehead and Rugged North Shore Coast Line—4 hours.

8:30 PM
Engineers' Night at the "Pops Concert." Engineers and their Ladies.

Saturday, June 10, 1950

9:00 AM
NSPE General Session. Society Members and guests invited.

9:00 AM
Ladies' Sightseeing Trip. Gore Mansion, Wayside Inn, Lexington and Concord. Luncheon at an outstanding Inn.

12:30 PM
Luncheon Address—Major General Lewis A. Pick, Chief of Engineers, Department of the Army.

2:00 PM
NSPE Open House. Address—Senator Henry Cabot Lodge, U. S. Senator from Massachusetts.
Address—Dr. David B. Steinman, Member State Board of Examiners of Prof. Engineers and Land Surveyors of the State of New York.

7:00 PM
Reception and NSPE Annual Meeting. Banquet, entertainment, music and dancing. Engineers and their Ladies.

Mail These Reservation Coupons Now!

RESERVATION COUPONS

Mail to:

ALVIN S. MANCIB
Chairman Registration Committee
26 Wallace Street, West Somerville, Mass.

Order Tickets Now.

Annual Meeting
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
at
Hotel Statler, Boston, Massachusetts
June 8, 9, 10, 1950

1. Luncheon

Thursday, June 8—12:30 p.m.

$3.00 per person—dress informal.

No. of Tickets .....

Total Amount $.....

2. Ladies' Tour, Concert and Tea

Isabella Stewart Gardner Museum.

Thursday, June 8—2:00 p.m.

(Complimentary—Dress informal.)

(Attendance limited to 100.)

Reserve (No. of Tickets) .....

3. MSPE Annual Dinner—Travelog

Thursday, June 8—7:30 p.m.

$4.50 per person—dress optional.

No. of Tickets .....

Total Amount $.....

4. Luncheon

Friday, June 9—12:30 p.m.

$3.00 per person—dress informal.

No. of Tickets .....

Total Amount $.....

5. Sightseeing Tour

Historic Downtown Boston—2 hours.

Friday, June 9—1:30 p.m.

$1.50 per person.

No. of Tickets .....

Total Amount $.....

6. Sightseeing Tour

Rugged North Shore Coastline, House of Seven Gables, Witch City Salem, etc.—4 hours.

Friday, June 9—1:30 p.m.

$3.00 per person.

No. of Tickets .....

Total Amount $.....

7. Engineers' Night at "Pops" Concert

Friday, June 9—8:30 p.m.—Symphony Hall.

$2.00 per person—dress informal.

No. of Tickets .....

Total Amount $.....

Ltd. Reservations. If desired, tables for 4 and 5 may be reserved as long as they last.

8. Ladies' Sightseeing trip

Gore Mansion, Wayside Inn, Lexington and Concord. Luncheon at outstanding Inn.

Saturday, June 10—9:00 a.m.

$4.50 per person, including luncheon.

No. of Tickets .....

Total Amount $.....

9. Luncheon

Saturday, June 10—12:30 p.m.

$3.00 per person—dress informal.

No. of Tickets .....

Total Amount $.....

10. NSPE Banquet—Entertainment—Dance

Saturday, June 10—7:00 p.m.

$5.00 per person—dress optional.

No. of Tickets .....

Total Amount $.....

Make checks payable to:

Mass. Society of Prof. Engineers

Tickets will be delivered at Registration Desk.

Prices include gratuities

Total Amount Enclosed $.....

Name: .....

Street: .....

City: .....

State: .....

Date: .....

TO THE *Editor* . . .

Employment Trends . . .

Dear Editor:

We note that in your issue for April 1950 there appears on page 18 a summary of a recent statement by the Bureau of Labor Statistics and a condensation of one issued by the American Society for Engineering Education, presented in such a way as to emphasize to the readers what appears to be a sharp difference of opinion between these agencies on the employment prospects for engineers. We wish to make it clear that such a sharp difference of opinion does not exist.

We do not wish to criticize you for your interpretation of these reports. Both the summary of the B.L.S. report and the A.S.E.E. news release which you condensed are summaries of much longer statements, and suffer from the common weakness of brief summaries, in that they necessarily omit details and qualifying discussions.

In making its study on engineers, the B.L.S. relied heavily on information derived by A.S.E.E. in the course of studies it has made over a number of years. A preliminary draft of the B.L.S. report was reviewed by many members of A.S.E.E., who have been interested in this question, as well as by officials of all the major engineering societies and many other members of the profession.

The statement issued by A.S.E.E. was designed to correct the impression left by some of the press reports of the B.L.S. study, reports which were misleading because they were incomplete, and which would tend to discourage high school students from entering engineering colleges. A.S.E.E. wished to emphasize the expanding opportunities for engineering graduates, both in engineering and non-engineering work, and the probability—which was pointed out by the B.L.S. — that within three or four years the employment prospects for engineering graduates are likely to be greatly improved, and that if freshmen enrollments in engineering colleges continue to decline, there may actually be more engineering jobs than engineering graduates to fill them. This point is also brought out in the summary of the B.L.S. report which you printed.

B.L.S. and A.S.E.E. are continuing to study the employment outlook for engineers cooperatively and with the help of the U. S. Office of Education and other organizations concerned with the problem. Analysis of employment trends and the appraisal of future employment prospects is an extremely difficult business, involving a large element of judgment and great possibilities for error. Nevertheless, our work so far has resulted in a good deal of unanimity of opinion as to the outlook for engineers. It would be extremely unfortunate if the impression is left with the public or with members of the profession that we have a serious difference of opinion on this question.

EWAN CLAGUE, Commissioner,
Bureau of Labor Statistics

THORNDIKE SAVILLE, President,
American Society for Engineering Education

► **THE AMERICAN ENGINEER is happy to print the above letter of clarification. Although the releases used by the AMERICAN ENGINEER were slightly condensed versions, they did, it is felt, retain all salient remarks.**

Why Join?

Dear Editor:

In the April, 1950, issue of THE AMERICAN ENGINEER, Mr. Arthur A. Vioni presents a clever analysis of the question, "What can the professional society do for me?" Mr. Vioni is to be complimented for clearly pointing out that the professional society can be of help only in proportion to its strength.

However, it is the belief of the present writer that the article does not go far enough in presenting the facts of (professional) life. Our attitude should be one of pointing up to non-members the *immediate* advantages to be gained by joining now and showing how we can make future gains in proportion to our organizational strength.

Firstly, thru the professional society, members get to know leaders in the engineering profession because it is significant that most of the outstanding engineers are active in professional society activities. We thus get an opportunity to learn of job openings or positions available oftentimes before they are advertised or listed with employment agencies. By way of illustration, the Kings County Chapter has listed a number of such openings on their bulletin boards and several of the members have also talked to prospects for such positions.

Secondly, our frequent talks and plant visits, available thru society activities, are educational. Certainly, they offer opportunities for keeping abreast of technological developments in one's own field as well as in allied professional fields.

Thirdly, the society, with its balanced program of social and other activities, offers occasions for social get-together of members. Certainly, in any heterogeneous group such as a county chapter of the professional society one can find his own milieu of possible friends.

Fourthly, our course encompassing Review for the Professional License exam, Conference & Discussion Methods, THE ENGINEER as a Supervisor, Professional Science and others are tailored to help our members and non-members improve their economic and professional status.

Fifthly, thru coordinated efforts of the professional society we can accomplish the manyfold objectives of establishing legal and public recognition; of guarding the public and the profession against unlawful practice of engineering by unauthorized persons; to advance ethical standards and proper practice within the profession; etc., to mention a few.

The above advantages are not exclusively those of the members of our society. Instead, we welcome active participation by non-members as well to the end that all those interested will gain.

For the above cogent reasons, every professional engineer ought to join the Chapter in his community and take an active part in its workings.

S. S. AIDLIN,
Brooklyn, N. Y.

Proposed . . .

Dear Editor:

Thanks for the copy of the AMERICAN ENGINEER, which I have read with much interest.

I was invited to address the convention of the NSPE held at Houston, Texas, on Dec. 8, 9 and 10, 1949, an honor I very much appreciated. At

(*Continued on page* 30)

Around The Nation With Our Members

NJSPE Honors Noble, Miller

The Committee on Awards of the New Jersey SPE has recommended that Charles Noble, Chief Engineer of the New Jersey Turnpike Authority, and Spencer Miller, Jr., Commissioner of the New Jersey Highway Department, be honored for outstanding work in their particular fields.

The award to Noble as Outstanding New Jersey Engineer cited his "outstanding service to the profession and mankind." Miller was chosen Outstanding Layman for his accomplishments as Highway Commissioner with particular reference to his application of sound engineering principles in his administration.

The presentations were made by Society President Hugh C. Clarke at the Annual Dinner-Smoker held in Newark on April 14. The 1950 theme of the Society prevailed, being "Engineering Serves New Jersey."

Members of the special Awards Committee are Frank C. Mirgain, chairman; Frederick Kraissl, Jr., Louis T. Klauder, Herman H. Reuter, and Ronald D. Crater.

Pictured above are Sam Turnbull, President, Florida SPE, left, and Miami Chapter President Doctor Palmer S. Craig, as the chapter head formally receives the group's charter. Guest speaker at the well-attended meeting was Stanley Milledge, Dade County Circuit Court Judge and former State's Attorney in Dade County.

Doc Claims Engineers Tops As Husbands

Here is a recent United Press article that is passed on without comment, as it speaks well for itself:

Girls looking for a permanent Valentine were advised to investigate the possibilities of the engineering profession.

Dr. James Bender, director of the National Institute for Human Relations, told a Carnegie Tech convocation that "engineers have the best hearts for marriage." He warned, however, that most of them are a bit shy and might need some prodding.

He cited six factors which make them the ideal prospect for a life-long Valentine.

#1. They apply logic to morals, economics, science and job loyalty.

#2. They're a bit shy, one-woman men, who don't get involved with their secretaries.

#3. They're homebodies who like to putter around the house.

#4. They're "tender lovers" and good parents who like large families.

#5. They're the least neurotic of all vocational groups and rarely quarrel.

#6. They're religious and good church attenders.

Calumet Chapter, Ind. SPE, Meet In Gary

The Calumet Chapter of the Indiana Society of Professional Engineers held its monthly dinner meeting March 29 at the Marshall House in Gary. The Calumet Chapter embraces the industrial district of Northern Indiana, including Gary, Hammond, East Chicago and Whiting.

John R. Swanton of Hammond, President, presided. The meeting, which was attended by 45 members and guests, was part of a drive for new members. Chapter now numbers over 50 members.

Guest speaker was Lieut. Colonel Nick Stepanovich of East Chicago. Colonel Stepanovich related his experiences in the counter-intelligence section of the U. S. Army Intelligence Service. His wide experience and effective work during the War brought many honors including nine decorations by six Allied Governments.

Ill. Member Named Decatur Official

Homer L. Chastain, 47-year-old Consulting Engineer and a member of the Central Illinois Chapter, ISPE, has been appointed commissioner of public property for Decatur.

Mr. Chastain succeeds the late Bushrod Sattley as chief of the city water department.

He interits the problems of a 63-employe waterworks plant and the task of completing a two million dollar water distribution and plant improvement project that Mr. Sattley and other council members started last year.

Mr. Sattley died January 15 in a St. Louis hospital.

NYSSPE Meets With Other Groups In N.Y.C.

The New York State Society of Professional Engineers through its Kings County Chapter were hosts at a meeting of professional engineers, land surveyors, and engineers-in-training, practicing in the metropolitan area, at the Brooklyn Engineers' Club, on Tuesday, April 4.

The meeting was devoted to discussions of the Society's activities in the engineering profession in this area. Such well-known professional engineers as Mr. George J. Nicastro, President of the New York State Society of Professional Engineers; Mr. John C. Riedel, Chief Engineer, Board of Estimate and Chairman of the new Traffic Commission, and Dean Eric Hausmann, Brooklyn Polytechnic Institute, attended the meeting. Activities in the engineering profession in relation with the Society's activities in the public interest were discussed.

Certificates Presented In Arkansas . . .

Approximately 90 members and guests of the Arkansas Society of Professional Engineers were present at the Society's regular meeting held in the Continental Room of the Hotel Marion, Little Rock, Arkansas, on March 28.

The highlight of this meeting and an innovation for the Arkansas Society was the presentation of Registration Certificates to those Engineers who had successfully completed their requirements for Professional registration. The certificates were appropriately presented by R. J. Rhinehart, PE, President of the Arkansas Board of Registration for Professional Engineers, and who is also a Director in the Arkansas Society of Professional Engineers.

The 10 Engineers shown in the picture above, top left, received their registration certificates at this time. Three others—C. O. Cogburn, Fayetteville; Thomas B. Fleeming, Jr., Reasor-Hill Corp., Jacksonville; and Maurice E. McCory, Pine Bluff, were unable to be present at the meeting, but received their Registration Certificates by mail.

This presentation ceremony was enthusiastically received by the Society, and plans are underway to make it a permanent feature in the registration procedure.

The principal speaker at the meeting was Dean A. A. Potter, PE, of Purdue University, who admonished all Engineers to take active interest in and to participate in government at all levels from local to national.

Pictured in the photo at top left are those who received certificates. They are: Front row—left to right: Delbert A. Schmand, U. S. Engineers, Little Rock; Dr. William B. Stiles, College of Engineering, University of Arkansas, Fayetteville; William A. Lewis, Jr., Reynolds Metals Company, Malvern; R. D. Lines, Forrest City; Henry E. Stratton, Little Rock. Back row—left to right: Warren C. Van Meter, U. S. Engineers, Little Rock; Dr. M. E. Barker, Chemical Engineering Department, University of Arkansas, Fayetteville; Frank D. Corley, Ft. Smith; Henry C. Willms, Malvern; and F. M. Methvin, Ft. Smith.

Extreme right of the back row is R. J. Rhinehart, PE of Pine Bluff, who is president of the Arkansas Board of Registration for Professional Engineers, and who presented the Certificates.

Shown at top right are: Left to right: R. J. Rhinehart, President of the Arkansas State Board of Registration for Professional Engineers; Dr. A. A. Potter, Dean of Engineers, Purdue University (Principal speaker); Fred J. Herring, President of the Arkansas Society of Professional Engineers; and George F. Brannigan, Dean of the College of Engineering, University of Arkansas.

In the photo on bottom right, the speakers' table is shown. Included are: Left to right: Earl Campbell, Field Representative of Highway Research; George F. Brannigan, Dean of the College of Engineering, University of Arkansas; Dr. A. A. Potter, Dean of Engineers, Purdue University; Fred J. Herring, President of the Arkansas Society of Professional Engineers; R. J. Rhinehart, President of the Arkansas State Board of Registration for Professional Engineers; and V. E. Scott, Arkansas Secretary of the Arkansas State Board of Registration for Professional Engineers.

ARK. EIT EXAM. TO BE HELD

The Arkansas State Board of Registration for Professional Engineers, announces its first examination for Engineers-in-Training to be held under the auspices of the College of Engineering of the University of Arkansas, Fayetteville, on May 13th.

Senior Engineering students of a recognized University or any other persons with equivalent education and training, will be permitted to take the examination. After passing this examination, Applicants will become registered as Engineers-in-Training and will be entitled to affiliate with the Arkansas Society of Professional Engineers.

After gaining sufficient experience as Engineers-in-Training, the Applicants will be required to take a specialized examination to become fully registered under the Arkansas law. The advantage of the Engineers-in-Training system will be that young engineers will be able to take the first part of their examination for registration in the accepted fundamentals of Engineering, immediately upon completion of their studies. Heretofore, the examinations have been found very difficult in some instances where the applicant has been away from school for several years.

Joint Meeting of Two Texas Chapters Planned

Plans for a joint meeting of the Central Texas and East Texas Chapters of the Texas Society of Professional Engineers were discussed at a meeting of the Central Texas Chapter.

The plans call for the meeting to be held in Corsicana within the next 60 days. Purpose of the meeting is to discuss joint engineering problems and promote goodwill between the two chapters.

President James Snell, presiding officially for the first time before the club, called for a renewed interest by association members, asking that individual members work toward building this chapter to be the largest and most active of the State.

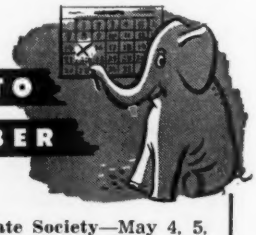
H. L. Roberts, State executive board member of Corsicana, invited the organizations to hold the joint meeting in Corsicana. He and H. V. Mowlan are members of the chapter from Corsicana.

Nueces Chapter, TSPE, Promoting Library

The Nueces Chapter TSPE February meeting was held in the City-County Health Unit Auditorium in Corpus Christi. Speaker of the evening was Nat Hardy, well-informed engineer who surveyed the discussion of the phenomena of periodicity in nature and the applications of the theory of cycles in mathematical predictions in the fields of natural science and economics.

Library Committee Chairman Allen reported of the progress in the campaign to enlarge the technical section of La Retama Library. Allen explained that money is presently avail-

(*Continued on page* 28)



DATES TO REMEMBER

New York State Society—May 4, 5, and 6, Statler Hotel, New York City, Mid-Century Convention and Engineering Industries Exposition.
Pennsylvania Society—May 19, and 20, New Castle, annual meeting.
District of Columbia Society — May 22, Washington, D. C., annual meeting.
Massachusetts Society—June 8, 9, and 10, Statler Hotel, Boston, annual meeting.
NSPE Annual Meeting—June 8, 9, and 10, Statler Hotel, Boston.
Georgia Society—June 16, and 17, Bon Air Hotel, Augusta, annual meeting.
Professional Engineers of North Carolina—July 27, 28, 29, George Vanderbilt Hotel, Asheville, N. C.

NEW ENGINEERING TEXTS

and books for professional reference

Legal Phases of Engineering:

CONTRACTS AND SPECIFICATIONS

By Ivan C. Crawford $3.75

Provides a basic understanding of American legal processes and the particular laws applying to contracts, business organization, real property, agency, sales, insurance, specifications, workmen's compensation, and other aspects of the construction industry. There is a chapter on the steps leading to award of contracts and an appendix containing samples of instructions to bidders, agreement forms, performance bonds, and labor and material bonds.

Theory of Modern Steel Structures

Revised Edition

Vol. I: STATICALLY DETERMINATE STRUCTURES $5.00
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An abridged one-volume edition will also be available this spring

By Linton E. Grinter

The new revised editions of these volumes bring completely up to date two outstanding texts on structures—texts which have been unreservedly recommended by teachers as "refreshingly clear, interesting, and intelligible to the student" . . . "characterized by high scholarship, breadth of application, freshness of viewpoint" . . . "the best written texts on their subject" . . . "of outstanding value."

Alternating Current Machinery

By Loyal V. Bewley $5.25

An up-to-date text including the recent advances in theory and in methods of analysis. Clearly and thoroughly explains the purposes and uses, theory, structural details and types of construction of the transformer, polyphase and single phase induction motor, commutator machines, synchronous generator and motor, and synchronous converter. General equations are developed to include both space and time harmonics for a generalized motor in the appendix.

Transmission Lines & Filter Networks

By John J. Karakash

Ready in June

A thorough, up-to-date engineering text and reference on communication circuits, extending to frequencies in the microwave range of transmission. Outstanding treatment of problems associated with transmission lines in low- and high-frequency circuits, and a complete discussion of the various types of filters. The specific engineering applications of theory are emphasized throughout.

Engineering Surveys

Revised Editions:

ELEMENTARY $3.75
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By H. Rubey, G. E. Lommel, and M. W. Todd

These coordinated texts offer complete material, without duplication, for the basic surveying requirements for all engineering students, both civil and non-civils. Especially notable in the new editions are the up-to-date material on photogrammetry; the many new illustrations; the inclusive, up-to-date tables.

Technical Sketching

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By H. H. Katz $5.00

Teaches in easy-to-learn steps, with hundreds of illustrative samples, how to acquire skill in freehand drawing; how to plan and execute accurate technical sketches of all kinds; how to "talk" in pictures, fluently and clearly, whenever you want to communicate engineering ideas or instruction to the shop, sales office, design conference, etc.

Elem'y Metallurgy and Metallography

By Arthur M. Shrager $4.75

Provides a useful basic knowledge of an important modern engineering science. Prepared particularly for the technical school student, this book should also be valuable to many engineers who need a practical, fundamental knowledge of modern metals, their production, uses, and major characteristics.

If you wish to consider any of these books for text use in your classes, write to our College Department for examination copies. Copies for personal use may be ordered on 10-day approval.

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(*Continued from page* 27)

able from public funds for purchase of books in the engineering field, and upon suggestions from members that certain books are desired, these books may be obtained.

Stolte Named Engineer-of-Month

Sidney L. Stolte, NSPE's President-elect, has been honored as Engineer-of-the-Month by the Minnesota Federation of Engineering Societies. The tribute read in part:

"In Minnesota there are two ways of spelling professional engineer.

"One is the conventional way.

"The other is 'S. L. Stolte.'

"For 'Sid' Stolte is acclaimed by his fellow-engineers as the man who personifies all the qualities of character, leadership, stick-to-it-iveness and good fellowship that they believe can help to make the community aware of their important role in everyday life.

"This July 'Sid' takes over the big job of president of the National Society of Professional Engineers, with its 22,000 members in 35 state societies. It is the high point of a varied and colorful career in which he has managed to combine his personal activities with a dominating role in the development of Minnesota's professional engineering groups. Only the most sincere kind of interest in professionalism has made it possible for him to give the thousands of hours he has given to state and local engineering groups."

Milwaukee Group Hears City Planning Talk

"Milwaukee Expressway Planning" was the subject at the regular meeting, April 11, of the Milwaukee Chapter of WSPE. William R. McConochie, an authority of broad national experience on municipal planning, spoke on the basic engineering which goes into the planning of expressways, the progress being made on such programs in various cities, and the report on Milwaukee's problems and requirements.

Mr. McConochie was particularly well qualified to discuss the situation in Milwaukee since he and his firm of municipal planning engineers, DeLeuw, Cather and Co., of Chicago, were engaged last year to survey and study Milwaukee's traffic and planning problems. Their report has been widely publicized and discussed, which made the program extremely interesting to all groups of engineers. Mr. McConochie's presentation of details of this report was illustrated with slides.

Lunch Speaks To Ohio Groups . . .

Milton F. Lunch, NSPE's Legislative Analyst, gave members of the Dayton, Ohio, Chapters of OSPE and AIEE, a picture of what goes on in Washington legislatively, when he spoke to the groups at a recent joint meeting. Lunch, shown in photo second from left, is pictured here with, l. to r., Carl N. Lohrey, President, Dayton Chapter, OSPE; Eugene Herzog, Chairman, Dayton Chapter, AIEE; and Joseph Rogers, Vice Chairman, Dayton Chapter, AIEE.

Deadline for Engineering Survey Extended to July 15

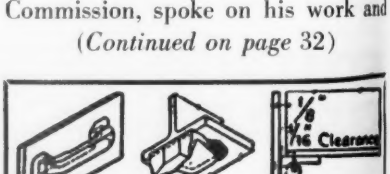
The closing date of the nationwide survey of selected engineering personnel sponsored by the Engineers Joint Council for the U.S. Office of Naval Research, has been advanced to July 15, 1950, it was announced recently. Intended to serve as a file of key engineers working in research, development and other scientific projects who can be called in on a full or part time basis to work on the broad scientific programs of the National Military Establishment, the survey was originally scheduled to close on March 15. Thus far, however, only two thirds of the 115,000 questionnaires which were sent out, have been returned by the engineers.

The questionnaires were mailed to engineers holding the full professional grade of membership in 18 national engineering societies, including NSPE. Those which have been returned have been tabulated but a third of the forms are still hiding away on desks and in files of engineers who have much to contribute to the national defense program. The availability of such a file would insure full utilization of American engineers in tasks for which they have been trained.

Goings On In The Quaker State . . .

Beaver County—March 21—Rochester, Pa. Lawrence Thurman, Curator, Old Economy Village for the Pennsylvania Historical and Museum Commission, spoke on his work and

(*Continued on page* 32)



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Ohio's 71st Convention Attracts Much Attention

Over 200 engineers and their wives arrived in Dayton, O., on March 16 to begin the Ohio SPE's 71st convention. They started off the Dayton meeting with inspection trips to some of the industries that have made Dayton famous. The many interesting exhibits, the well attended dinners and luncheons, the live attractive ladies' program, the big student conference, the strong functional group meetings, the fine speakers and the enthusiastic interest of the over 700 members who attended the conclave, all were climaxed in a well attended Banquet honoring Mr. Charles F. Kettering and other friends of the Society at the speakers' table.

Toledo's Mayor Michael V. DiSalle was visiting Dayton during the Convention. He and Mayor Louis W. Lohrey, who is the father of the Dayton Chapter's president Cal Lohrey, were guests of the Convention. They were generous in their praise of the engineering profession. Other out of town guests of honor during the convention were Lieutenant Governor George Nye from Waverly, who spoke briefly at the Banquet, Dean Curtis L. Wilson of the Missouri School of Mines and Metallurgy, President George S. Voinovich, of the Architects Society of Ohio from Cleveland, Col. Chester Lichtenberg, retired General Electric engineer from Fort Wayn, Indiana, President-elect of NSPE, Sidney L. Stolte from "Twin Cities," Minnesota, William J. Reardon, President of the Reardon Industries, Inc., Cincinnati, and John A. Molloy, Vice-President and Technical Director Armco International Corporation, Middletown.

The final act before the curtain was drawn to another milestone of OSPE achievement was the Banquet with its award to Charles F. Kettering who through his engineering research and development helped to make Dayton famous. The award had to be presented to Mr. Kettering in absentia since his plane had been grounded in Florida two days before and he was too sick with the flu to continue the trip to Dayton as planned. The Lorain County Chapter received the membership trophy and the usual installation of new officers took place at the Banquet.

Noted Speakers

"We are on the threshold of infinite destruction or infinite prosperity," said Dean Curtis L. Wilson as he talked on his subject, Winning Victories in Advance. Dean Wilson held the Ballroom full of engineers and student members almost spellbound as he optimistically looked at our task of preparing ourselves individually and collectively to win victories in advance by doing those things which will guarantee a victory when the test comes.

"Our technological advance has been astounding. It has outstripped the development of human relations," said Col. Chester Lichtenberg, speaking about the Engineer in this Age of Specialization. "If the engineer is to be true to the objectives of the National Society of Professional Engineers by seeking the advancement of the public welfare and by seeking the promotion of the professional, social and economic status of the Professional Engineer he must individually take an active interest in communal and civic affairs." To do this he must affiliate with the Church of his choice, join his technical and professional engineering societies, a social organization of his liking, and finally he should interest himself in civic affairs, said the General Electric Engineer. He ended his talk with: "Engineers should be among the first to recognize that America has been and still is a land of opportunity; I might even go so far and state that it is THE land of opportunity. In my humble opinion, we should work to place opportunity before security, for we cannot have more by dividing what we have. We can only have more by producing and creating. The 'isms' of today are based upon the principle of dividing what we have. The American idea which is also the idea of the true engineer is to produce and to create so that we can make more things for more people at less cost."

In an effort to solve some of our differences of opinion which exist between Engineers and Architects the President of the Ohio Architects was invited to speak on "Opportunities for Improved Cooperation Between the Architectural and Engineering Professions." A fine spirit was exhibited by the speaker and no doubt the future will see great advances in the working out of any differences. President Voinovich voiced his personal opinion when he proposed that there should be some attempt made to join hands at Convention time with the ultimate goal of a joint convention. He further suggested that there should be but one Board of Registration for Engineers and Architects. There was every indication that this was the beginning of more friendly relations in the future.

John A. Molloy of Armco gave in considerable detail the problems confronting engineers in Overseas Engineering and Consulting Work. In answering his own question of, "Why bother with such work?" he said that, "besides the profit angle anything we can do today to strengthen our position abroad is helpful to our political position." It has taken two world wars to make us more world conscious and we resent "spending our money to insure a bottle of milk a day to everyone in the world without their doing anything to earn it." The speaker then reminded his audience that "We of the United States were glad to get financial, engineering and technical help from abroad on a substantial basis for well over one hundred years after we became a nation." The speaker ended by saying that "every job well done abroad will help us overcome our No. 1 enemy and contribute toward the establishment of a better world for our children."

Educating the 1950 Model Engineer

(*Continued from page 7*)

THE profession of medicine, law and architecture have already taken the step of requiring five or more years of training in the accomplishment of their professional objectives. If engineering maintains the status of a profession, it will be forced to do the same.

I have not heretofore referred to one other factor which should appeal to our sense of responsibility and pride as engineers. We have in past years leaned heavily upon reinforcements furnished by the training in other countries. This training is no longer available to us in any large amount. We are looked to therefore for technical leadership by other nations of the world. If we are to keep our country strong, if we are to keep in the foremost of technical development, if we are to furnish the many new horizons necessary to keep our democracy a vital force among people, we must not, in my opinion, compromise or improvise in the development of our future professional engineers.

Editor's Note: The above article was condensed from a talk by Dr. Hollister before the Philadelphia Chapter, PSPE.

Letters to the Editor

(*Continued from page* 24)

this meeting I was heralded as the oldest practicing Professional Engineer in the U.S.A. Whether true or not, I am 91 years of age—a graduate of the University of Mo., class of 1884. I am presently research engineer for Tulsa Co., and public relation personnel man.

In my address at Houston, I set forth that the Engineer was not adequately represented in any State or National government. The legal fraternity controls the Justice Department and they have some 300 members out of 351 members of congress (a majority); and since the Legislative Department controls taxes, it makes the appropriations and distribution of the funds so legal fraternity controls, in effect, the Executive Department, also.

Therefore the legal fraternity of some 400,000 members actually controls and operates all Department of State and National governments, with few, if any, exceptions. I suggested that the American Bar Association was thereby over-represented in the councils of our government, State and National.

I proposed to the convention that the Engineers was more entitled to representation in the Legislative and Executive Departments of government than the legal fraternity, for the reason that no community wealth can be created by anyone practicing law. The product of a law practice is only an agreement of words before a judge or jury, but no community wealth is produced. This, of course, is self evident, since all wealth is created by 3 groups of persons. First is the Engineer who must design all the plants that make the things civilization demands, plus the equipment in the plants. Second, the business man who risks his money to hire labor and erect the plant and then the labor to operate the equipment; and third, the labor that actually erects the plant, makes the equipment and operates the equipment to produce the things civilization demands.

The legal fraternity has its proper functions in the government, which is to maintain and preserve our life, liberty and property and protect before the courts our individual rights as set out in the U.S. and State Constitutions. Their function is not to dominate and operate our entire government. The people elect these lawyers so nothing can be done about that, so I suggest that the National Society sponsor an amendment, to the State & National Constitutions, proposing that such State elect a Senator and Congressman at large, the qualification to be a licensed professional engineer. Thus, getting 96 Representatives in Congress for the National Society.

The 400,000 persons who produce no wealth now run the whole government, why should that program continue? This same address was made in an address to the Oklahoma State Society of Professional Engineers on Jan. 9th, 1950.

T. C. HUGHES,
Tulsa, Okla.

Contradiction . . .

Dear Editor:

In reading through the March issue of THE AMERICAN ENGINEER, we note an apparent contradiction in two of the articles.

On Page 7, in the article describing "An American Engineer Interview," we read the following as stated by Senator Darby:

> "This, of course, is a long term process, but we should remember that it wasn't too many years ago when the doctor had far less respect and professional status than he has today."

Then on page 10, in the article by F. F. Gregory, entitled, "Why is Public Relations Important?", we read:

> "And the public support for socialized medicine is sufficient evidence that the gratitude and loyalty that our grandfathers felt toward their medical practitioners has largely disappeared."

We bring these interesting opposing thoughts to your attention without comment.

GEORGE F. JENKINS
South Charleston, W. Va.

1950 Employment Programs for Graduates In Engineering and Physical Science

(*Continued from page* 9)

Increases during the first year tend to be somewhat smaller and to be given at one time, usually later in the period.

The marked relative decline in the number of organizations giving rates for business and arts graduates indicates that, within these organizations, employment of such graduates probably will drop more sharply than that of technical graduates.

The major value of the survey seems to be in the light it can throw on the country's requirements for engineering graduates. The lack of background figures for those with physical science degrees makes it unwise to attempt any general interpretation of those secured for them.

Extrapolation of the demand for engineering graduates reported in the 1949 survey, in terms of the proportion of all such graduates in the profession represented by the participating organizations, indicated a total demand in that year for some 25,000 new graduates. The Committee's survey of actual placements up to November covering engineering schools with three-fourths of the year's total graduates, showed that they were about 50% higher than that figure and total placements presumably were still greater.

The major part of this difference seems to lie in the opportunities found in the great number of relatively small organizations impossible to cover in a limited survey of this type, most of which do not have organized employment programs. Although the 1949 returns represented almost one-third of the country's engineering graduates in the profession, they covered less than one-sixth of its industry in terms of total employees. By industry, here is meant not only manufacturing but mining, construction, transportation and other public utilities and comparable activities in government. Some of these smaller organizations may not have been able to secure satisfactory engineering graduates in the intense competition shortly after the war, others may not have previously recognized needs for such men.

With the larger graduating class this year and the substantial decrease in the demand from organizations participating in this survey, intensive cultivation of the smaller organizations for openings not only in engineering but in production and operations, leading to supervision and sales, offers the best chance for satisfactory placement results. In view of the situation, moreover, employing organizations with either immediate or long-term needs for men with technical training have an exceptional chance to fill such needs with carefully selected men. About 51,000 bachelor's degrees will be given in engineering during 1950. Next year the total will be 30% less, and, on the basis of freshman and sophomore enrollments there will be further sharp declines in 1952 and 1953.

Lehigh Valley Chapter Hosts to Students

At a meeting held on April 20, on the campus of Lehigh University in Bethlehem, Pa., the Lehigh Valley Chapter of the PSPE, was host to engineering seniors of the school.

Minnesota Society Member Wins Road Award

Minnesota Highway Commissioner M. J. Hoffmann has been presented the highest national honor of America's highway industry and profession, the George S. Bartlett Award. He is an active member of the MSPE, NSPE.

The presentation to Commissioner Hoffmann was made at a banquet of the American Road Builders' Association at Cincinnati. The Bartlett award, established in 1931, is conferred annually upon an individual who has made "an outstanding contribution to highway progress." The Minnesotan was named 1949 winner by a three-member board of award, made up of the presidents of the American Association of State Highway Officials, the Highway Research Board of the National Research Council and the ARBA.

Under rules for selection, the "outstanding contribution" may be in administrative, technical, inventive or general fields. In the past, winners have included such men as Thomas H. MacDonald, Commissioner of the U. S. Bureau of Public Roads; Paul G. Hoffman, president of the Studebaker Corp., South Bend, Ind., now Economic Cooperation Administrator; Frank T. Sheets, chief engineer of the Illinois Highway Department for nine years and now president of Portland Cement Association, Chicago; Robert C. Moses, New York City park commissioner and ranked as one of the nation's greatest authorities on parkways and advanced highway administration; C. H. Purcell, California director of public works; and Charles M. Upham, engineer-director of American Road Builders' Association.

M. J. Hoffmann, Minnesota highway commissioner and a member of the Minnesota Society of Professional Engineers (right) receives from Col. Enoch R. Needles, ARBA President, the George S. Bartlett Award, the highest national honor the highway industry and profession can bestow.

Fulbright Educational Program of Interest

The number of countries participating and individuals accommodated in the Fulbright educational exchange program has increased steadily since its inception in 1948. In that year programs of exchange were in operation with four countries — Burma, China, the Philippines, and New Zealand—and awards were granted to 101 individuals, including U. S. and foreign nationals. During the following year the number of countries actively participating increased to ten, adding the United Kingdom and British Colonial Dependencies, Belgium and Luxembourg, France, Greece, Italy, the Netherlands and Norway. As a result, approximately 1,000 openings were made available to U. S. nationals and an equal number to foreign nationals for the coming academic year (1950-51). It is expected that programs of exchange following the recent signing of agreements with Australia, Egypt, and Iran will be initiated in the near future. Negotiations are in progress with India, Pakistan, Korea, Turkey, Siam, and Austria.

It is obvious that the Fulbright Act makes possible a program of educational exchange on a scale without precedence in modern times. Authorized by Public Law 584 (known as the Fulbright Act) it is financed by the use of certain currencies and credits acquired through the sale of surplus property abroad. The maximum sum available is the equivalent of 140 million dollars which is to be utilized over a period of 20 years. The program is of especial significance to members of university faculties and learned professions not only for the opportunities provided for personal enrichment to individuals, but also because it opens channels for the increase and advancement of existing knowledge. It is not possible at this time to estimate the degree to which the ultimate purpose of the Act—to increase the understanding between the peoples of the United States and those of other countries — will be realized.

Administration Of The Program: The Board of Foreign Scholarships was set up by the Act to supervise the exchange program both in the U. S. and abroad, including the selection of sponsoring institutions and of recipients of awards.

It carries out its responsibilities in the U. S. through four Cooperating Agencies which have been authorized to give publicity to the program, receive applications from American citizens, screen and recommend candidates, review and comment upon country programs, and advise the Department of State and the Board of Foreign Scholarships on possible changes which might achieve a better balance between the interests of the foreign country and the U. S. The Cooperating Agencies are also expected to assist in raising dollars for the maintenance in the U. S. of foreign recipients of awards, in effecting institutional connections for them, and wherever suitable, facilitating direct exchanges between foreign and American teachers and lecturers. The Conference Board Committee performs these functions for candidates for research scholar and visiting professor awards; the Institute of International Education (2 West 45th Street, New York City 19) for candidates

(*Continued on page* 33)

(*Continued from page* 28)

the interesting history of the Beaver Valley Region.

Delaware County—On March 15, Francis S. Friel of Albright and Friel, well-known Philadelphia consultants, spoke to the Chapter on "Chester's Water Supply." The question of water supply is becoming more and more important, and Mr. Friel outlined the problems and how they are being solved in Chester.

Erie Chapter—Latest meeting was on March 27 when Dana Jones, Secretary of Erie Manufacturers Association, spoke on the subject, "Labor and Pensions and Their Relations to the Engineering Profession."

Harrisburg Chapter met on March 20th and after a short business session saw a new film entitled, "Alloy Steel," produced by Bethlehem Steel Company.

Johnstown held a meeting on March 29 at the beautiful Sunnehanna Country Club. In addition to the business session there was a film by Dow Chemical Co. entitled "Treasure from the Sea."

Lehigh Valley held a "Ladies' Night" on March 17 with Dr. Lillian Gilbreth as the speaker. Dr. Gilbreth, head of her own firm of internationally known Consulting Engineers and recipient of honorary degrees from all over the world, found time to raise a family of 12 children, two of whom wrote the best seller, "Cheaper by the Dozen." Approximately 160 were in attendance.

Lincoln held their latest meeting on March 27 at Lincoln Woods Inn (near York) and had as their guest speaker William H. Eckenrode of York, who spoke on the "Life of Abraham Lincoln."

Midwestern are very busy with their plans for the Convention. Everybody is working and interested, and they are out to sponsor a fine convention.

Northeast—On March 24, Adrian E. Ross, Assistant to President, Sprague and Henwood, Inc., spoke to the Chapter on "Diamonds and Their Use in Industry." Mr. Ross is a recognized authority on diamond drilling and his talk was of exceptional interest.

Philadelphia held a meeting of special interest on April 6 when Dean Disque of Drexel and Dean Hollister of Cornell spoke on "Educating the 1950 Model Engineer."

Pittsburgh met on March 23 and heard Walter J. Kelly, Arbitrator, speak on problems of Engineers in the field of personnel relations. Randolph W. Mallick, P.E., member of Pittsburgh Chapter, has been elected to the office of Burgess of the Borough of Chalfant.

Reading held a double-barreled program on March 8 featuring a sound film in technicolor by General Electric Co., entitled, "Power by Which We Live," and a talk by an insurance representative explaining a group insurance plan which can be made available to the Chapter.

Deputy ECA Chief Addresses ASME

William C. Foster, deputy administrator of the Economic Cooperation Administration, addressed the spring meeting of The American Society of Mechanical Engineers in Washington, D. C., on April 13. His topic was "The Marshall Plan—An Instrument for World Peace." The meeting, which was held in the Hotel Statler, April 12-14, marked the 70th anniversary of the society.

It was the first national meeting of the ASME in the nation's capital since 1930, when the society celebrated its 50th anniversary in Washington. The organizational meeting of the society was held in April, 1880.

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Culture

(*Continued from page* 16)

his life on this earth."

In the light of present events, there is a burning need that we recognize our dire extremity and do something about it. We must not play our fiddle while the fires we have set rage about us uncontrolled. Engineers are, as a class, practical people, men of action. I think our dilemma can be resolved by a clear realization of the current situation. Corrective action would follow as a matter of course.

Now, being practical—how can we find the means to protect our stupendous technical and economic gains? How can we attain the type of culture needful to our preservation?

Collectively, we might:

A. Urge expansion of our engineering courses to five or six years, including in them several sound liberal arts courses.

B. Establish in every engineering society a Committee on Liberal Arts, whose function would be to promote a broader culture by all other possible means.

C. Endeavor to have every section of every society devote one meeting a year to politics, literature, economics, art, or other such broadening subjects.

Individually, we might:

A. Resolve to ready and study carefully at least one cultural book each month.

B. Attend one or two good plays a year (or the opera or ballet, if we feel equal to the initial shock!).

C. Try to acquire a taste for "good" music.

D. Subscribe for one or more of the better magazines (*Harpers, Atlantic, Forum*, etc.).

E. Cultivate the acquaintance of people of culture.

F. Join a class in public speaking.

G. Take an active interest in the civic affairs of our community.

H. Vote (by all means)!

I. Take a leaf from the mystic Yogi, or from him who visits his church for a quiet moment—meditate on whatsoever things are good and noble. Leave the workshop of industry on occasion, and philosophize beside the babbling brook. Contemplate the clouds and the everlasting hills, and let Nature "culture" us. Cultivate the Broader Outlook. Let not the tree obscure the venerable woods.

(Now, some of this won't "take." Let it not disturb us; most cultured people are left stone cold by *some* of these things!)

A most hopeful sign of progress is our trend toward a practical, professional organization.

After long years of disheartening effort we do not yet have a strong, cohesive, cooperative organization to give us, in this age of organizing, of group action, a fully recognized professional status. Many times, in recent years, engineers have tried to band together in "national" organizations to improve their status. And much of their action has been abortive. I think we may take some heart in the present rapid growth of a national engineering society based on the solid foundation of engineering registration.

It may succeed, at long last. We may yet have the equivalent of the ABA or AMA for engineers.

If it fails, I am sure it will be due in large measure to the lack of the qualities and attributes which I have commended to you in this article.

Shall we run, not walk, to the nearest library?

Fulbright Program

(*Continued from page* 31)

for student awards; the U. S. Office of Education (Washington 25, D.C.) for candidates for elementary and secondary school teacher awards; and the American Council on Education (744 Jackson Place, N. W., Washington 6, D. C.) for candidates for awards in American schools abroad.

The Nature of Awards to U. S. Visiting Lecturers and Advanced Research Scholars: Awards are made in the currency of the country to which the individual is going and are considered sufficient to meet all necessary costs of living and incidental expenses abroad. Round trip transportation for grantees is also provided when the foreign currency is acceptable to carriers. Awards are usually made for the period of one academic year, require affiliation with an educational institution, and may be used in only one country during a given academic year.

The Nature of Awards to Foreign Nationals: Awards to foreign nationals for teaching or study at any level cover only the costs of travel to and from the U. S. They may be utilized for as short a period as three months; a longer period, of course, is preferable. It is apparent that foreign nationals cannot make use of a travel grant unless they have dollar resources to cover living costs while in this country. An exchange program for undergraduates and predoctoral graduate students has long been recognized as valuable and scholarships and financial assistance to foreign students have been given by American colleges and universities to make this possible. On the teaching and research level, however, there has never been a comparable opportunity for interchange with foreign scholars and teachers. Invitations to such foreign visitors would not only enrich the teaching and research staffs of American universities and colleges, but would be a major factor in making the Fulbright program reciprocal and mutually beneficial to the participating countries and their educational institutions.

How and When to Apply for an Award for University Teaching or Advanced Research: Requests for application forms and information regarding specific opportunities should be addressed to the Conference Board Committee during the summer or fall of the year preceding the academic year for which the award is desired. For example, applications for the academic year 1951-52 will be accepted during the coming summer or autumn after the Committee has received the announcements of the individual country programs. According to current procedures the final date for acceptance of applications is November 30 except for a few openings for which a short extension of time may be granted. This schedule is subject to annual revision.

Procedures for Inviting a Foreign Lecturer: (1) It is possible for an American university or college to take the initiative in extending an invitation to a particular professor or research scholar known to the institution for a particular post. In this case the institution is expected to advise the foreign scholar to file an application for a travel grant with the U. S. Educational Commission which administers the program in his own country. Upon the recommendation of the U. S. Educational Commission the application is then forwarded through the Department of State to the Conference Board Committee for review prior to final action by the Board of Foreign Scholarships. (2) Universities or colleges may ask the Conference Board Committee to initiate a request for the selection of a lecturer or scholar by a given U. S. Educational Commission to fill a particular opening. It is desirable that both kinds of invitations be issued as early as possible in the preceding academic year. (3) It is expected also that the U. S. Educational Commission will report the availability of certain candidates for teaching or research who need supplementary dollar support. The Conference Board Committee will then initiate efforts to place them in teaching or research positions in U. S. universities and colleges.

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